REPORT RESUMES

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THE REPORT OF THE MICHIGAN STUDY OF INDUSTRIAL TEACHER COMPETENCE.

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DESCRIPTORS- SURVEYS, INDUSTRIAL ARTS TEACHERS, QUESTIONNAIRES, TRADE AND INDUSTRIAL TEACHERS, *EDUCATIONAL NEEDS, CURRICULUM PLANNING, *INDUSTRIAL ARTS, PROGRAM EVALUATION, *TRADE AND INDUSTRIAL EDUCATION, TECHNICAL EDUCATION, ADULT VOCATIONAL EDUCATION, COOPERATIVE EDUCATION, *TEACHER EDUCATION, TEACHER QUALIFICATIONS, MICHIGAN,

THE PROBLEM OF THIS STUDY WAS TO DETERMINE PRACTICES AND POLICIES FOR KEEPING INDUSTRIAL EDUCATION TEACHERS IN MICHIGAN QUALIFIED WITHIN THEIR EVOLVING TECHNICAL AREAS OF SPECIALIZATION. IT REQUIRED (1) AN INVESTIGATION OF DESIRABLE GOALS AND PROGRAM NEEDS BY ORGANIZATIONAL LEVELS, (2) RECOMMENDED PRACTICES AND POLICIES BASED ON CONCLUSIONS DRAWN FROM DATA, AND (3) THE FORMULATION OF PROPOSALS THAT MIGHT BE SUBMITTED TO SELECTED FOUNDATIONS OR GOVERNMENT AGENCIES FOR THEIR HELP IN IMPROVING THE COMPETENCE OF INDUSTRIAL TEACHERS. AN INTERVIEW FORM WAS DEVELOPED TO GET THE OPINIONS OF 56 PEOPLE WHO WERE (1) REPRESENTATIVES OF BUSINESS, LABOR, COMMUNITY COLLEGES, AND TECHNICAL INSTITUTES, (2) PROFESSORS OF INDUSTRIAL EDUCATION, (3) TEACHERS, (4) COUNSELORS, AND (5) ADMINISTRATORS. THERE WERE 29 QUESTIONS IN THE INTERVIEW FORM, 20 PERTAINING TO CURRICULUM AND NINE PERTAINING TO TEACHER COMPETENCE. ON THE BASIS OF DATA COLLECTED AND SHOWN IN SUMMARY FORM FOR EACH QUESTION, EIGHT PROPOSALS FOR AN ACTION PROGRAM WERE DRAFTED. THESE INCLUDED (1) AN EXPERIMENTAL PROGRAM TO RECRUIT AND PREPARE NEEDED INDUSTRIAL EDUCATION TEACHERS FOR DETROIT-METROPOLITAN AREA SCHOOLS AND THE ADJOINING COMMUNITY COLLEGES, (2) A PROJECT FOR PROVIDING MORE ADEQUATE PREPARATION FOR INSERVICE INDUSTRIAL EDUCATION TEACHERS, AND (3) A PROGRAM AT WAYNE STATE UNIVERSITY APPLIED MANAGEMENT AND TECHNOLOGY CENTER TO UPDATE AND EXTEND INDUSTRIAL TEACHER COMPETENCY. (PA)

EXHIBIT C

ED014529

THE MICHIGAN STUDY OF INDUSTRIAL TEACHER COMPETENCE

WAYNE STATE UNIVERSITY

VT 00547

THE REPORT OF
THE MICHIGAN STUDY OF
INDUSTRIAL TEACHER COMPETENCE

MAY 1965

A Special Vocational Education Research Project

Conducted by the Department of Industrial Education

College of Education, Wayne State University

Funded Through the Division of Vocational Education

Michigan Department of Public Instruction

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
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Special appreciation is extended to Dr. Leon Alger, Research Consultant, Department of Public Instruction, State of Michigan, for his many hours of assistance.

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G. Harold Silvius
Andrew F. Ford

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THE REPORT OF
THE MICHIGAN STUDY OF
INDUSTRIAL TEACHER COMPETENCE

May, 1965

PART A - - INTRODUCTION

Title of Project

THE MICHIGAN STUDY OF INDUSTRIAL TEACHER COMPETENCE: With Concern for Technical Advance and Its Effect on Policies and Practices for the Initial Preparation and the Upgrading of Industrial Education Teachers

The Problem

The problem was directed at practices and policies essential to keep industrial education teachers of Michigan qualified within their evolving technical areas of specialization. The problem called for (1) an investigation of desirable goals and needed programs by organizational levels (i.e., senior high school or community college), (2) recommended practices and policies based on conclusions drawn from data, and (3) the formulation of selected proposals (based on findings) that might be submitted to selected foundations or government agencies supporting educational research for their help with an action program directed at improving the competence of Michigan's industrial education teachers.

The Specific Objectives of the Study

The specific objectives of the study were:

1. To determine:
    a) if certain goals for industrial education in Michigan's schools need to be stressed or deemphasized;
    b) those subject areas in industrial education where teacher competence has fallen behind technological advance;
    c) what recent technological areas need to be infused in industrial subjects in Michigan's schools and colleges;
    d) industrial subjects needed for retraining or upgrading programs that have not been offered because qualified teachers were not available;
    e) opportunities that Michigan teachers have to participate in industrial training programs and institutes to upgrade skilled technicians;
    f) the extent that Michigan school systems and colleges conduct institutes to upgrade industrial education teachers in their specializations;
    g) how needed industrial education teachers may best be recruited;
    h) what should be stressed in the initial preparation of Michigan's industrial education teachers; and
    i) what is needed to upgrade industrial education teachers now on the job.
2. To disseminate the findings of the research with the goal of improving industrial education in the schools and colleges of Michigan through qualified industrial education teachers required for preparing, upgrading, and retraining craftsmen and technicians essential to Michigan's labor force.

3. With the assistance of special task force groups, composed of qualified leadership representing industry, labor, education and employment services, formulate selected proposals for an action program to solutions of problems identified through interviews with the fifty-six persons selected to react to issues formulated from factors mentioned in Objective One.

Steps in Conducting the Research and the Chronological Record of the Study

On February 15, 1963, G. Harold Silvius, as director of The Michigan Study of Industrial Teacher Competence, submitted Form 132 to Robert M. Winger explaining the budget in the amount of $1,989.00 to facilitate Phase One and the initial step of Phase Two of this research. The original proposal for this research as a Special Michigan Vocational Education Research Project had been submitted under date of December 21, 1962. On March 28, 1963, Wayne State University received State Warrant No. B 885227, in the amount requested, to facilitate these early steps of the study. The money was deposited in Account 302-1601. A resume of expenditures against this account through October 31, 1963 was submitted to Robert M. Winger, Assistant Superintendent for Vocational Education, Michigan Department of Public Instruction, in a letter dated October 28, 1963.

Director Silvius and associate director Sutton met with the Michigan Chief for Trade and Industrial Education and his staff on April 19, 1963 to (1) review the general categories to be included in the interview instrument and (2) discuss how the sample was to be drawn in respect to the interviewees who might be invited to participate, and who would be qualified to represent and speak for their school systems or institutions -- in respect to the factors identified in Objective One of this research. The personnel for Task Force One was then selected and invited to participate in an all-day meeting held on the WSU campus on May 28, 1963. (Persons who assisted are listed in Appendix B). The agenda for these sessions provided for a critical review of (1) the over-all design for the study, (2) what was then tentative draft two of the interview instrument, and (3) the persons who were under consideration to be interviewed to facilitate Objective One of the research.

Much work went into the development of the interview instrument which appeared in tentative draft one, two, and three before it was finalized. Tentative draft one, for example, was reviewed critically by several individuals, including all members of The Michigan State staff for Trade and Industrial Education. Associate director Sutton personally conducted try-out interviews to evaluate the reaction to proposed items. Leon Alger, Research Consultant with the Michigan DPI, was most helpful in his two trips to Detroit to work with Drs. Silvius and Sutton in the refinement of the interview instrument. As previously mentioned, each individual item on tentative draft two was critically reviewed by leaders from education, industry, and MESC, as they served on Task Force One. A statement was prepared for the members of Task Force One by the director of the study to summarize the recommendations that came from the all-day meeting on May 28, 1963. This report carried a proposal for (1) the reorganization of the interview instrument and (2) the categories for the classification of the interviewees. It was concluded from the phone calls and letters directed to the director of the study that members of Task Force One reacted favorably to the proposals for moving ahead with the research.

The efforts of Andrew F. Ford, who was employed as a Research Assistant by WSU to facilitate this research, resulted in tentative draft three of the interview instrument, the identification of Selected Persons Classified by Groups to Receive Invitations to be Interviewed, the development of a Map of Michigan Showing Location and Classification of Proposed Interviewees, and the plan for the Specific Items in Interview Instrument to be Answered by Respondents in Each Category (shown in Appendix D on page 100, of this report). Further, arrangements were made to have Andrew F. Ford, during August and September, 1963, try out tentative draft three of the interview instrument with six of the fifty-six individuals selected to be interviewed. These persons were chosen to be representative of the various categories that made up the sample of interviewees. This was done to determine those minor changes still needed in the interview instrument before it was duplicated in its final form. This check resulted, also, in the refinement of the plan for the Specific Items in Interview Instrument to be Answered by Respondents in Each Category (that appears now as Appendix E).

The 1964 June issue of the Guild News, sent to active students, alumni, and selected leaders in occupational education (throughout the United States), carried a lead story to report the initial phases of The Michigan Study of Industrial Teacher Competence.

The remaining fifty-one interviews were conducted, responses tabulated, and conclusions drawn between December 23, 1963 and July 10, 1964.

A final report of the study was prepared during the summer and fall of 1964. Following the preparation of this report, 1,500 copies were duplicated for dissemination by Wayne State University to (1) all persons who become involved in the study, (2) key persons in Michigan's DPI, (3) Michigan directors of vocational and practical arts education, (4) selected representatives of manpower (both labor and management), (5) Michigan's institutions engaged in industrial teacher education, and (6) other persons and institutions requesting copies.

Recommendations were formulated, in the form of selected research proposals or projects to be considered by persons now in industrial education as studies or doctoral dissertations, or to be presented to foundations or government agencies that may be interested in assisting or underwriting an action research program to implement the proposals formulated from the conclusions supported by data collected from the interviews. Further, each of the selected proposals, that appear beginning on page 105, were evaluated by special task force groups, composed of representatives from Michigan's manpower, education, and research interests, and who would be qualified to assist with a critical analysis of data and especially in respect to reacting to materials that would be suitable for making contacts with foundations and government agencies.

Selection of the Interviewees

The persons to be interviewed for this study were selected on the basis of three primary criteria. The first of these was that a reasonable geographical distribution should be made to insure a fair representation of the many varied educational situations in the entire state. The location of the interviewees ranged from Marquette in the North, to Detroit in the South, and from Muskegon in the West, to Alpena in the East. To the extent possible, varied community populations were included to recognize the individual problems in small, medium, and large population centers.

The second primary criteria for this selection was to identify persons to be interviewed whose work and job position brought them in contact with industrial education programs. These contacts provided for the views of industrial education teachers (who had been recognized), vocational directors, counselors, representatives of community colleges, and technical institutes, and professors of industrial education who deal directly with the students and industrial education programs, as well as superintendents and principals who are concerned with the administration and implementation of industrial education programs. Included, also, were the representatives of labor, business and industry, and leaders in Michigan who are especially concerned with the results of industrial education programs in this state.

The third primary criteria considered was that the persons to be interviewed be selected from the recommendations made by experts associated with the proposed categories. For example, the representatives of industry and business were selected from persons suggested by Dr. Robert Lusk, Educational Director, Automobile Manufacturers Association, and Mr. Clyde Reed, The Institute for Economic Education. The superintendents were selected from persons suggested by the Department of Educational Administration, Wayne State University. The persons selected to be interviewed for the other categories were selected in a similar manner. Appendix A lists the complete categorical listing of the persons selected to be interviewed for this study.

The Development of the Interview Instrument

Any discussion of teacher competency must inevitably include a discussion of the content taught. It is also assumed that a discussion of content must also include an examination of the aims and objectives that justify the inclusion of any given content in a program of studies.

It is in terms of this relationship that this interview instrument gives recognition to both aims and objectives, and the content of current and proposed industrial education programs. Further, consideration was given to recommendations and suggestions regarding needed changes or improvements in industrial teacher education at all levels.

Parts A -- Junior High Schools (Grades 7-9), B -- Senior Comprehensive High Schools or Special Vocational Schools (Grades 10-12), C -- Community Colleges and Technical Institutes are organized with the first few questions of each part devoted to the aims and objectives appropriate to that level. The middle group of interview items for each part is concerned with the current and proposed programs of industrial education. The concluding items of each part deal with current and proposed practices of industrial teacher education.

Part D -- Out-of-School Youth and Adults is concerned with proposed programs for those persons who have terminated their association with a regular instructional program but still require additional formalized education.

Part E -- Upgrading Industrial Education Teachers is concerned with the policies and practices of in-service teachers, boards of education, and the Department of Public Instruction for the State of Michigan, that affect the competency of teachers.

Part F -- Considerations for Extending Industrial Education Programs contains interview items that suggest some proposed programs of industrial education to keep pace with the emerging changes of a technological society.

PART B - - THE FINDINGS

This section contains the summary statements of the interviewees for each item in the Interview Instrument. After each question is stated, the responses are reported in terms of the typical or representative response made by selected interviewees. No attempt has been made to qualify any comment, only simply to report the responses as they were given. When appropriate, tables to show the frequency of a specific response are included. In addition to the representative responses for each item there are conclusions and/or observations drawn from the responses. In this report "a conclusion" is operationally defined as a statement that reflects, in the opinion of the researchers, sufficient unanimity among the interviewees to be considered an assertive consensus. And "an observation" is operationally defined as a statement that the researchers feel represents a frequent or strongly taken position about an issue, but not sufficiently supported to be regarded as a conclusion. Some of the items, however, do not have conclusions or observations associated with them because the researchers felt that the summary response itself represented the conclusive opinion of the group and, as such, was not subject to further interpretation as was the case with some other items. The responses to the question in item 2, on page 13 illustrates this exception.

On the basis of these reported data the selected proposals for an action program for improving and up-dating industrial teacher competency were drafted and are included in the concluding section of this report as Appendix F.

JUNIOR HIGH SCHOOL (GRADES 7-9)

1. Do current industrial arts programs at the junior high level adequately help youth appraise their aptitudes and interests for industrial activities (as this could give direction to youth undertaking pre-vocational preparation for employment)?

TABLE 1 -- CATEGORICAL RESPONSES WITH RESPECT TO HELPING YOUTH APPRAISE APTITUDES AND INTERESTS IN JUNIOR HIGH SCHOOLS

Category of Interviewees	Number of Interviewees	Yes	No	Not Certain
Professors of Industrial Education	6[a]	4	2	0
Industrial Education Teachers	5	2	3	0
Vocational Directors	5	0	5	0
Principals	5	3	2	0
Counselors	5	3	1	1
Total	26	12	13	1

[a] This category has one more interviewee than the others since each industrial teacher education institution in Michigan, with the exception of Wayne State University, was represented.

Table 1, shown above, gives the categorical groups of interviewees asked to respond to item 1, of Part A, so that general reactions regarding a "yes" or "no" response might be apparent. Typical explanations from categories where a majority of the respondents indicated a "yes" response were:

> Industrial arts education helps youth appraise their aptitudes and interests since it provides for an exploration of materials and tools necessary for preparation for the world of work.
>
> Exploration provides for an understanding of the processes of industry and gives meaning to the student about industrial activities as he attempts to make a vocational choice.

A selected explanation of a "yes" response from the "Industrial Education Teacher" category was:

> Industrial arts programs do help to the extent that they provide for an exploration of the activities and where there is emphasis given to providing a wide range of experiences with tools and materials.

Typical explanations from categories where a majority of the respondents indicated a "no" response were:

> Industrial arts programs do not adequately help youth appraise their aptitudes and interests, because we have made a sex discrimination by offering these experiences, for the most part, to just boys.
>
> Too many industrial arts programs are subject oriented and not sufficiently student oriented.
>
> There are insufficient funds, tools, and materials to present an adequate program.

Selected explanations of a "no" response for the "Professors of Industrial Education," "Principals," and "Counselors" categories were:

> Industrial arts programs do not adequately help because they do not reach all the students.
>
> Too often students are removed from the program for service purposes, such as hall guards and messengers.
>
> There is too much concern for just making projects and not on industrial orientation.

Here is a selected explanation of a "not certain" response from one of the "Counselors":

> I'm not sure that enough is being done in this area even with the facilities and funds presently available to us.

Conclusions or Observations Drawn from Responses to Item 1

Conclusions:

1. Industrial arts programs in the junior high schools of Michigan are not at the present time adequately helping youth to appraise their aptitudes and interests for future occupational choices.
2. An improved, more extensive guidance program, within the limits of the present funds, equipment, and materials, must be developed to accomplish this aim.

Observations:

1. More students need to be involved in industrial arts programs at this level.
2. Industrial arts teachers need an improved preparation in successful counseling and guidance practices.

2. What other major aims for industrial arts are important at the junior high level?

The following list of aims for industrial arts was compiled from the suggestions and recommendations of the interviewees. To:

1. develop an appreciation for, and an understanding of, processes and products.
2. develop safe work habits.
3. develop vocational interests.
4. provide exploratory experiences with a variety of tools and materials.
5. contribute to the general education of all youth.
6. develop basic skills with common tools, machines, and processes.

Here are selected comments made with respect to other major aims for industrial arts:

> The kind of work required should be as difficult and precise as the student's skills will allow according to his age and motor coordination.
>
> Industrial arts education should help students understand that talent in manipulative activities is just as important as talent in academic areas.
>
> Grading should be based on the student's attitudes and effort. Evaluation of the student's work should be a method for assessing participation.

3. Should industrial arts teachers at the junior high school level give special emphasis to the identification of an aptitude for manual dexterity as an aim of industrial arts education?

TABLE 2 -- THE DEGREE OF AGREEMENT BY CATEGORIES REGARDING THE EMPHASIS TO BE PLACED ON THE IDENTIFICATION OF MANUAL DEXTERITY

Category of Interviewees	Number of Interviewees	Of Great Importance	Of Some Importance	Of Minor Importance
Vocational Education Leaders in Michigan	5	1	4	0
Professors of Industrial Education	6	2	1	3
Industrial Education Teachers	5	2	2	1
Vocational Directors	5	1	2	2
Superintendents	5	1	2	2
Principals	5	3	2	0
Counselors	5	1	4	0
Total	36	11	17	8

The preceding table, number 2, gives the categorical response from those invited to react to the "degree of importance" that should be placed on the identification of manual dexterity through the industrial education program in the junior high school.

Typical explanations to support the response "of great importance" were:

From a Principal:

> An evaluation of dexterity helps students to be realistic about their own abilities.

From a Professor of Industrial Education:

> This is a basic objective. Without this identification there is no justification for the things we do in manipulative classes.

Typical explanations that support the "of some importance" response were:

From a Counselor:

> The teacher should be aware of dexterity, but some students have not yet developed physically, consequently it would be unfair to say that they do not possess manual dexterity.

From a Superintendent:

> How important this is will depend on the student's own vocational goal.

From an Industrial Education Teacher:

> Young people at this age require broad experiences with tools and materials regardless of their degree of dexterity.

Typical explanations made to the response "of minor importance" were:

From a Professor of Industrial Education:

There are too many differences between a diverse number of students at this age for any emphasis to have any useful meaning. It is more important to develop good habits, attitudes, and interests.

From a Vocational Director:

Manual dexterity is becoming less essential in an advancing technology.

Conclusions or Observations
Drawn from Responses to Item 3

Conclusions:

1. There is no strong evidence to indicate that special emphasis should be given to the identification of manual dexterity as a major aim of industrial arts education at the junior high level.
2. There was a measure of agreement, however, that this identification is of some importance and should be considered by the industrial arts teacher.
3. To help a student assess his degree of manual dexterity could be done through industrial arts activities and be a most useful guidance factor.

Observations:

1. Industrial arts teachers currently on the job in Michigan schools in the junior high schools need a more adequate understanding of child growth and development.
2. Having students develop a degree of manual dexterity should not be used as a basis for evaluating performance in a junior high industrial arts program.

4. The more complete industrial arts multiple activity programs stress the following subject areas. Would you indicate which of these areas should be retained, in the years ahead, to fulfill the goals mentioned for junior high school students with respect to items 1, 2, and 3.

_____ a. Woodworking
_____ b. Metalworking
_____ c. Plastics
_____ d. General Drafting
_____ e. Electricity-Electronics
_____ f. Power Mechanics (including Hydraulics and Pneumatics)
_____ g. Graphic
_____ h. Industrial Crafts (Ceramics, etc.)

TABLE 3 -- RATINGS OF SELECTED INDUSTRIAL ARTS ACTIVITIES BY CATEGORIES

Category of Interviewees	Number of Interviewees	Mean (x) Rating of Selected Industrial Arts Activities by Categories							
		a	b	c	d	e	f	g	h
Vocational Education Leaders in Michigan	5	1.2	1.2	1.5	1.2	1.2	1.2	1.2	1.8
Professors of Industrial Education	6	1.5	1	1	1	1	1	1	1
Industrial Education Teachers	5	1.4	1.2	1.2	1	1.2	2	1.2	2.2
Vocational Directors	5	1.2	1.4	1.6	1	1.4	2.2	1.6	1.8
Superintendents	5	1.3	1.3	1.3	1	1.8	1.5	1.9	1.7
Principals	5	1.2	1	1.4	1.2	1.4	2	*1.5	2.4
Counselors	5	1.2	1	1.5	1	1.8	2.2	1.4	*1.25
Total	36	1.3	1.2	1.3	1.1	1.4	1.7	1.4	1.75

Code: 1 -- retain with emphasis.
2 -- retain but not emphasize.
3 -- delete, de-emphasize, or do not consider appropriate for this grade level.

* -- Only four of the possible five interviewees responded to this item; therefore, four was used as the divisor to determine the arithmetic mean for this category.

The preceding table, number 3, shows how the groups of interviewees rated (according to the numbered code) each activity commonly found in the more complete industrial arts programs. The column labeled "total" shows the mean rating for all categories for each given activity.

A selected comment of interest from a vocational director suggested the re-organization of the activities that were submitted with item 4. His proposal was to re-group the activities in this manner:

I -- Materials of Industry -- including present offerings in woodworking, metalworking, plastic, and the industrial crafts.

II -- Industrial Communication -- including general drafting and the graphic arts.

III -- Energy Sources and Utilization -- covering electricity-electronics, and power mechanics.

This organization provides for a treatment of occupational galaxies or clusters rather than individual occupations.

Here are typical explanations for the "1 -- retain with emphasis" response:

> So much of today's industry requires a knowledge of electricity-electronics that I cannot conceive of a program worth endorsing that does not contain generous amounts of this activity.
>
> Drafting and the graphic arts are as much a part of communication as speech and writing.

Following are some typical explanations for the "2 -- retain but not emphasize" response:

> I wouldn't want to support any particular emphasis because I feel the student's own problem and solution will determine the appropriate materials or operations to be used.

> All of these activities are necessary, but I wouldn't want any one to be made more important than any other.

Typical explanations for the "3 -- delete, de-emphasize, or do not consider appropriate for this grade level" response were:

> The teachers of Michigan have over-emphasized woodworking. I would like to see less of it and more of others.
>
> In our school we do not think that much emphasis on power mechanics is appropriate. This is better done in the senior high school.
>
> A knowledge of the industrial crafts is needed as a part of general education, but in the junior high I think the art department can do a much better job of presenting this area.

Conclusions or Observations Drawn from Responses to Item 4

Conclusions:

1. All subject areas listed should be retained.
2. Metalworking and general drafting should be given the greatest emphasis in the junior high school, whereas power mechanics and the industrial crafts should receive the least emphasis.

Observations:

1. Present activities included in the area of the industrial crafts might best be taught by the Art Department in the junior high school.
2. Any great emphasis on power mechanics is more appropriately confined to the senior high school.
3. The instruction in these areas should be broad in scope and related to the problem with which the student is involved.

5. What other subject areas or major units should be included at the junior high school level in addition to those mentioned in item 4?

The following list of additional subject areas or major units was compiled from the suggestions and recommendations of the interviewees in response to item 5.

a. Union-Management Relations
b. Principles of Automation
c. Principles of Research and Planning
d. Elements of Design
e. Training for Service Occupations
f. Auto Repair and Maintenance
g. Household Mechanics

6. How would the subject areas or major units mentioned in item 5 contribute to the aims discussed in items 1, 2, and 3?

Supporting comments for the additional units mentioned in item 5. (Responses are coded according to subject areas or major units that are being suggested for additional consideration).

5a. As part of their general education all students should know the history and current practices of the labor movement and their relationship to industrial management.

5b. Every member of society should understand what is meant by automation since he must live and work in a society that is becoming so fully mechanized.

5c. No matter what kind of work a person does, he should know how to go about finding the solutions to problems and be able to organize his work to implement solutions.

5d. In every real object there are characteristics of design (function, material used, cost, etc.) that may be desirable or undesirable. As consumers of industrial products, the students should learn to evaluate these characteristics.

5e. This is an expanding area and will provide many opportunities for students to make sound vocational choices.

5f. Auto mechanics are needed very badly and if the student can get some fundamentals at this level, he will be in a much stronger position for employment after high school.

5g. Every boy (or girl) will some day live in a house or apartment in which he (or she) will be responsible for helping with the upkeep and maintenance. If they don't learn these things now, when will he (or she) learn them?

7. What changes or improvements would you recommend in the preparation of industrial arts teachers for the junior high schools of Michigan?

Typical comments to illustrate recommendations made by more than one interviewee follows:

From a Professor of Industrial Education:

> Although it would be extremely difficult to require it of current teachers, I would like to see some supervised work experience in industry as a regular part of the teacher's preparation.

From a Counselor:

> These teachers need a broad background in many areas [mathematics, science, language, arts, etc.] of the instructional program. In addition they need to have better preparation in child growth and development so that they will be better able to counsel young people at this age.

From an Industrial Arts Teacher:

> Industrial arts teachers at this level need a stronger background in science and mathematics especially as these areas apply to industrial activities. Sometimes too much professional education is required at the expense of a better foundation in science, mathematics, and other technical subjects.

Selected recommendations drawn from the responses to Item 7 follow.

From a Superintendent:

> The Michigan universities should train teachers specifically for the junior high. Too many people are teaching in the junior high school,because they weren't able to obtain a position in a senior high school.

From a Counselor:

> Industrial education teachers should have more real contact with children before they graduate.

From a Principal:

> There is a need for industrial arts teachers to be more cognizant of other areas such as mathematics, science, and language arts, and the problems of teachers within these other areas.

Some desirable characteristics for industrial arts teachers in junior high schools were suggested by three or more interviewees. They felt that a successful industrial arts teacher:

1. has an interest in children -- including participation in out-of-school activities.
2. likes to work with tools and materials.
3. has an adequate technical background -- a real command of each subject area to be taught.
4. possesses a generalized education -- has an appreciation for the humanities.
5. has a real concern and knowledge of counseling and guidance practices.

Conclusions or Observations Drawn from Responses to Item 7

Conclusions:

1. A limited amount of supervised industrial work experience should be an integral part of the teacher's preparation for teaching industrial arts in junior high schools.
2. Persons preparing to teach at the junior high school level should have a better understanding and knowledge of other subject areas, particularly the basic sciences and their application in industrial activities.

Observations:

1. More emphasis needs to be given to aspects of teaching that are unique to the junior high school and youth in this age group.
2. At some Michigan institutions too much time is devoted to courses that deal with the history and the philosophy of education, structures of education, and the administration of public education, at the expense of additional technical and manipulative experiences in industrial education.

SENIOR COMPREHENSIVE HIGH SCHOOLS OR SPECIAL VOCATIONAL SCHOOLS (GRADES 10-12)

8. What should be the major aims for industrial education in Michigan comprehensive senior high schools?

Typical aims mentioned by a majority of the interviewees in response to Item 8 follow.

To have youth in such schools:

1. continue with the exploration and use of the tools and the materials of industry.
2. provided with broad general skills suitable for entrance into a post-high school training program.
3. understand the role of industry and technology in a modern society.
4. develop the ability to plan and work alone or in groups.
5. develop good attitudes toward work.

Typical aims of those mentioned by four or more interviewees in response to Item 8 were:

To:

1. encourage the student to develop job entry skills in one occupational area or cluster.
2. develop a degree of manual dexterity.

Selected aims mentioned by three or less interviewees in response to Item 8 were:

1. provide skill development for occupational competency.

One of the representatives from industry apparently would not vigorously support a program of industrial education in Michigan's senior high schools. He stated that these schools should:

provide a general education only, with no vocational specialization.

9. What should be the major aims for industrial education in special vocational schools (such as the Wilbur Wright Cooperative High School in Detroit)?

Typical of those aims mentioned by most of the interviewees in response to Item 9 were:

To:

1. provide specialized training for job entry competency.
2. provide an adequate general education.
3. provide a foundation for technical development.
4. provide a foundation in the basic sciences.

Other selected aims mentioned by four or less interviewees in response to Item 9 were:

To:

1. provide a cooperative work experience as an integral part of the program.
2. provide an educational program for the below average student.

These selected comments made by interviewees in response to Item 9 question the need for such schools:

> I am sure we should have specialized schools like this. I have a feeling that a portion of every comprehensive high school [program] should be devoted to this specialized need.
>
> The special vocational school is no longer needed. This type of education should be conducted by the community college or technical institute. The high school should concentrate on foundation courses that prepare the student for post-high school education.

10. Explain the differences that should exist in the aims for industrial education in these two types of schools (Questions 8 and 9).

The explanations that were made for the differences between the two types of schools are typified by the two responses that follow.

From a Vocational Director:

> There is no significant difference in aims between these two schools. The vocational schools are organized largely for administrative efficiency. They are able to offer depth programs that would otherwise be economically impractical to provide in the relatively scattered comprehensive high schools.

A Principal commented:

> The only real difference that I see between the two schools is that the vocational school provides more emphasis on skill development for students who have a specific occupational goal in mind, whereas the comprehensive high school offers more exploration and a greater breadth of offerings for students who may not be sure as to what they want to do.

A small segment of the interviewees did reflect the attitude of the explanation from a Representative of Industry and Business that follows.

> Our company doesn't want any pre-trained people at all. We would be pleased if each student spent as much time as possible in the academic classes. We prefer to do our own specific training.

Conclusions or Observations
Drawn from Responses to Item 10

Conclusions:

1. There is a need for the specialized depth programs that are currently being offered in the specialized vocational school.

2. When the comprehensive high school is unable to offer depth programs, either because of an insufficient number of eligible students or because of economic prohibitions, area vocational schools should be formed to meet this need.

Observations:

1. Some industries prefer to do certain kinds of specialized training and prefer that the student be prepared with very broad and generalized experiences. This is particularly true of some public service and utility occupations.

11. What industrial education offerings are needed for the following groups of students in grades 10-12, in Michigan's schools?

The following statements reflect the typical opinions of most of the interviewees regarding the five identified categories of high school students,

11a. For college-bound youth preparing for the professions.

From a Representative of a Technical Institute:

> The college-bound youth should have approximately one school year of generalized industrial education classes sometime between the ninth and twelfth grades. Some specific courses such as drafting, electricity-electronics, might be elected if they are appropriate to the collegiate area in which the student planned to enroll.

From a Vocational Leader in Michigan:

> More emphasis should be placed on the study and application of scientific principles to industrial activities. A study of the relationships between organized labor and industrial management would be extremely valuable for these students.

Selected comments from interviewers who did not agree with the preceding statement were:

From a Principal:

> These students should not take any industrial education in the senior high school, because there is insufficient time as it is, to adequately prepare for college entrance requirements.

From a Counselor:

> Because of the knowledge explosion we are experiencing, greater demands are placed on these young people than they may be capable of assuming. They simply must have a greater depth in the academic subjects if they are to succeed in college.

11b. For youth planning to go to community colleges or technical institutes for preparation as technicians (i.e., in the areas of automotive technology, electricity-electronics, etc.)?

The succeeding statements are representative of those made by the majority of the interviewees regarding youth who plan post-high school education in community colleges or technical institutes.

From a Representative from Industry:

> The youth preparing to go to the community college or technical institute should have basically the same kind of education as the college-bound student. There would be a good chance that these students would want to continue their education in a four-year institution even after the community college or technical institute.

From a Professor of Industrial Education:

> The industrial education offerings for this group of students should be very broad and general in scope with some concentration given to drafting. A heavy emphasis on mathematics, science, and an application of scientific principles is important.

From a Superintendent:

> Drafting, or engineering graphics, would have general education implications for this group of students.

A response from a Principal was selected as indicative of the concern of some interviewees for the need for any industrial education experience:

> Since I feel that these students are basically the same as those who will go on to a college or university, I would strongly urge that any manipulative work be postponed until they actually reach the community college or technical institute. The most important thing we can do for these people is to give them the soundest academic program we can devise.

11c. For youth hoping to qualify for an apprenticeship in a skilled trade after graduation from high school (i.e., building trade or manufacturing industry)?

These selected comments are typical of those interviewees who favored special consideration in the schools to meet the needs of the pre-apprentice students.

> Arranged in order of descending importance these students should have experiences in drafting, machine shop, electricity-electronics, auto mechanics, woodwork, and graphic arts.
>
> As much experience and as many courses [in industrial education] as possible should be in the student's program who hopes later to enter apprenticeship.
>
> A student who plans on becoming a skilled tradesman should have as complete a grounding in the basic operations and other fundamentals that relate to the trade of his choice as the school can provide. These fundamentals would include a mastery of mathematics and some science.

Some of the interviewees did not favor a special program for students who wished to enter an apprentice program.

The following statement from a Counselor sums up this feeling:

> The senior high school should not provide any special pre-apprentice programs since modern industry, as we know it in this state, has so few openings for young people. In addition it has been my experience in placing students after graduation that certain unions still continue to require "recommendation" from one or more members. This practice amounts to having to have a close relative in that trade before a youngster can expect to be admitted to a program.[1]
>
> In my opinion it isn't realistic for a boy to point himself toward an apprentice program. He is much better off preparing himself in some broader areas so that he may be able to pursue more than one type of post-high school education.

11d. For youth who will enter employment directly after graduation from high school?

According to a majority of the respondents, the critical factor with respect to these students is whether or not a vocational choice can be identified.

Following are selected responses that are typical of the recommendations of the interviewees when the vocational choice has not been made or identified.

From a Counselor:

> These young people need further exploration beyond the junior high school and improved counseling to try and help them make a realistic evaluation about where they want to go and how they can get there.

From a Principal:

> Until these students decide what it is they want to do, we are obliged to provide the soundest, broadest general education possible, including more exploratory work in industrial education.

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[1] According to the conclusions as stated in, Hagemeyer, Richard H. An Investigation of Factors Considered in the Selection of Apprentices by Manufacturing Companies in Michigan. Ed.D. WSU Doctoral Dissertation, 1961, this practice of requiring "recommendations" is at least rare and by and large no longer exists to any noticeable degree.

From a Representative from Labor:

> Students in this group need a good foundation of general knowledge. The school should also try to develop good work habits and attitudes.

Where the vocational goal can be identified or a vocational choice has been made by the student, the interviewees made more specific recommendations about what should be done for these students. The following selected responses will illustrate these recommendations.

From a Vocational Director:

> When the student has some idea of the kind of work he wants to do, an individualized program should be designed for him with this vocational goal. I think that this program should include some cooperative work-study to give him a little experience. Without this experience such a youngster would have difficulty obtaining employment.

From a Representative of the Community College:

> It needs to be pointed out to these students that the modern world of work will require some post-high school preparation. To be ready for the opportunity they should be encouraged to pick an area of industrial activity and pursue it to as great depth as possible.

An Industrial Arts Teacher suggested the following:

> If possible these students should be directed to a specialized school for training. If this isn't possible, they should be exposed to an intensive program, including some work experience that will give them a salable skill. Such students are probably capable of doing anything from painting walls to repairing mixers and toasters. The service occupations should be given special attention.

11e. For youth who drop out of high school and attempt to directly enter employment?

Some of the interviewees did not feel that the instructional program itself was a factor in helping these students. The remarks which follow are typical of their viewpoint.

A Counselor stated:

> Give me a good counselor and an understanding shop teacher, and I do not plan on having any drop-outs.

A Representative from Labor felt that:

> Get the father to go back to school, and the son is more likely to finish his education.

A Representative from Industry and Business said:

> I don't think that the schools are liable for this situation. These students too often represent the insecurity and faults of our society. Often they are merely voicing the uneasiness that many persons feel about the world and their place in it.

An Industrial Arts Teacher indicated that:

> Many of these students need professional help with their emotional and social problems. I am neither trained nor do I have sufficient time to help a student in this way.

Many of the interviewees, however, did feel that some rather specific things could be done for these students. The remarks that follow characterize this position.

From a Professor of Industrial Education:

> We know altogether too little about this student. Much more research needs to be done in this area, because an early identification is extremely important if we are to provide effective counseling for these cases. If you can identify this student before he drops out, you can frequently counsel him into becoming a member of one of the other classifications mentioned in this study.

One Principal has actually implemented a program for prospective drop-outs. He described it this way:

> When a boy tells me that he is going to leave school, I try to find out what he wants to do for a living. We then prepare a special program for him that may have only one class in it. If he wants to spend the whole day in just one shop, he is free to do so. Within the limits of the rights of other students he can do pretty much what he wants.

> Although this kind of programing dispenses with the ordinary required number of hours of credit, we feel it is more important to salvage a student than it is to conform to some rather rigid specifications. Besides, it has been our experience that after a period of time on this special program, most of these potential drop-outs begin to realize that some of the academic areas are necessary and they ask to be put back on the normal program of studies.

Support for the idea that the drop-out needs a specialized program was given by a Professor of Industrial Education, who said:

> If a lack of success or disinterest in certain subject areas were instrumental factors in the student's leaving school, putting him in the same kind of academic environment, if he were to return to school again, will very likely just reinforce his reasons for leaving the first time and will probably result in a second drop-out. A re-structuring of the whole school situation for this student is needed. We probably also need an expansion of the evening school program for these people.

A Representative from Industry and Business recommended the following:

> If all attempts to keep this student in a regular program fail, he should be put in a very intensive program to provide him with as many skills as is possible in a needed occupational area, particularly in one of the service trades.

12. What changes or improvements would you recommend in the preparation of industrial education teachers for the comprehensive senior high school?

A majority of the interviewees in all the categories expressed concern regarding the amounts and types of industrial experience and technical preparation needed by today's industrial education teachers. The following statement from a Representative of Labor, regarding industrial experience sums up the general feelings of the interviewees.

> I can't understand how any teacher can adequately talk about what industry is unless he has actually experienced it. Although I am sure that experience in the area he is teaching is highly desirable and perhaps should be required, the most important factor for the comprehensive high school teacher is that he has worked in some occupation so that he understands what it means to report for work on time, do a job under pressure, work with other employees, and contribute to a finished product.

A Vocational Director represented the views of other interviewees when he said:

> The industrial education teacher needed for both the comprehensive and the specialized high school should be required to have up-to-date industrial experience in the area he intends to teach. This experience should be an integral part of his preparation as a vocational education teacher.

The statement that follows, from a Representative from the Community College, reflects what most of the interviewees felt regarding the industrial-technical courses provided by the universities to prepare teachers.

> There is an increasing need for the teacher education institutions to provide more opportunity for prospective teachers to acquire greater depth of knowledge and skills in technical subjects. These institutions need to provide a greater number of up-to-date courses that deal with the actual content these people plan to teach. While I believe that some professional education is very important, I don't see much value in employing a person who knows a great deal about the structure of education during the last three hundred years, but knows relatively little about the subject he has been hired to teach.

An Industrial Education Teacher commented in this manner on technical preparation, and, quite typically for the other interviewees:

> Senior high school industrial education teachers should have sufficient breadth to be flexible in their teaching situation. At the same time, however, they

> should have developed a rigorous competency in a specialty that includes much more depth in mathematics and science than they are presently getting. Also, I think that student teaching, or at least contact with children and the school, should come earlier in their preparation.

While the largest majority of the interviewees preferred to comment on both the comprehensive and the special vocational school teachers, concurrently, a few of the interviewees did make some specific recommendations regarding the preparation of the special vocational high school teacher. The following statements were excerpted from the general comments concerning Item 12, and suggest that the special vocational school teacher needs especially strong qualifications in his area of specialization.

> A special vocational teacher should definitely be required to have actual experience in the area he teaches.
>
> The vocational school teacher should be able to demonstrate job competency in the area he teaches as well as possess a good deal of depth knowledge about the subject.
>
> I would think the special school teacher should be a journeyman or have at least four years of on-the-job experience.

Conclusions or Observations Drawn from the Responses to Item 12

Conclusions:

1. All industrial education teachers in senior high schools should have some industrial work experience, and preferably in their teaching area.
2. Industrial education teachers in special vocational high schools should have depth industrial work experience in the area in which they teach.
3. There is a need to increase both the number and depth of the technical courses that are a part of industrial teacher preparation.

4. Additional experience in mathematics and the sciences is needed by the senior high school industrial education teacher.

Observations:

1. Industrial work experience should be an integral part of an industrial education teacher's preparation.

2. There may well be too much emphasis on professional education courses in some institutions at the expense of the courses that are directed at the teacher's technical preparation.

COMMUNITY COLLEGES OR TECHNICAL INSTITUTES

13. How would you react to these programs for occupational education in the Michigan community colleges or technical institutes?

    a. To provide the initial preparation for technicians needed in industrial occupations.

TABLE 4 -- CATEGORICAL RESPONSES REGARDING COMMUNITY COLLEGES OR TECHNICAL INSTITUTES PROVIDING THE INITIAL PREPARATION FOR TECHNICIANS

Category of Interviewers	Number of Interviewees	Very Important Aim	Not Important	Not Certain
Representatives from Industry and Business	5	5	0	0
Representatives from Labor	5	5	0	0
Vocational Education Leaders in Michigan	5	5	0	0
Professors of Industrial Education	6	5	0	1
Industrial Education Teachers	5	5	0	0
Representatives from Technical Institutes	5	5	0	0
Vocational Directors[a]	4	4	0	0
Superintendents[b]	3	3	0	0
Principals	5	5	0	0
Counselors				
Total	43	42	0	1

[a] One or more interviewees declined to react to this series of items, 13-17.

[b] Items 13-17 were optional for these categories.

The data in Table 4, which are concerned with the preparation of technicians [industrial and engineering] as an aim of the community college or technical institute, shows an almost uniform agreement regarding this issue. One of the interviewees did decline comment on this issue. He felt that he was not qualified in this area and decided that he could not contribute anything of value to the evaluation. Although Part C, Items 13-17, was an optional section for the Principals, all five reacted to Item 13, whereas only three of the five superintendents, for whom this section was also optional, reacted to the question.

Typical explanations for the response "very important aim" were:

> If this instruction is not provided at this level, where can a person become prepared? Because both of these institutions community college and technical institute try to meet the needs of the community this is a natural and legitimate function.

One interviewee reacted to this question with the "not certain" response. He said that he felt this way because:

> I don't believe in stereotyping all programs to look alike. There is no doubt that some types of technician training should be offered. On the other hand there are probably some other types that should be provided by industry through their training programs.

Conclusion:

> Providing the initial preparation for industrial or engineering technicians in industrial occupations is a very important aim of the community college or technical institute.

13b. To provide the related instruction for those learners who have entered an organized apprenticeship in the manufacturing or building trades.

TABLE 5 -- CATEGORICAL RESPONSES REGARDING COMMUNITY COLLEGES OR TECHNICAL INSTITUTES PROVIDING THE RELATED INSTRUCTION FOR APPRENTICES

Category of Interviewees	Number of Interviewees	Important Aim	Important	Not Certain
Representatives from Industry and Business	5	4	0	1
Representatives from Labor	5	3	1	1
Vocational Education Leaders in Michigan	5	5	0	0
Professors of Industrial Education	6	6	0	0
Representatives from Community Colleges	5	5	0	0
Representatives from Technical Institutes	5	5	0	0
Vocational Directors	4	3	0	0
Superintendents	3	3	0	1
Principals	5	5	0	0
Total	43	39	1	3

The preceding Table 5 shows a high degree of unanimity of opinion with regard to the community college or the technical institute providing the related instruction for apprentices. It would seem significant that none of the interviewees felt that this aim was not of some importance. Even the few interviewees who indicated a "not certain" response, stated that there were some kinds of related instruction that ought to be provided by these institutions.

The general reaction from the interviewees could be summed up by a statement made by a Representative of Labor, who said:

> The community has the responsibility, through these two types of institutions, to provide for the continuing education of its young people. Very often a company will be either too small or not properly staffed to give this instruction. The community college or technical institute, being in the business of education, is far more capable of providing this related instruction than any other agency in the community.

The one response from the interviewee who reacted as "not certain" said:

> I'm not sure just who ought to give this instruction. It may be that the adult education program in the community is a better place.

Another interviewee indicated the "important aim" response but qualified it as follows.

> It might be that the community college should do this, but I think that some industries have not carried a fair share of the load in providing facilities or monies to support such instruction.

A Conclusion Drawn From Responses to Item 13(b)

It is an important aim of community colleges or technical institutes to provide the related instruction for learners who have entered a recognized apprentice program.

13c. To provide basic training for the non-apprenticed trades.

TABLE 6 -- CATEGORICAL RESPONSES REGARDING THE PROVIDING OF BASIC TRAINING FOR THE NON-APPRENTICED TRADES AT COMMUNITY COLLEGES OR TECHNICAL INSTITUTES

Category of Interviewees	Number of Interviewees	Very Important Aim	Not Important	Not Certain
Representatives from Industry and Business	5	4	0	1
Representatives from Labor	5	4	0	1
Vocational Education Leaders in Michigan	5	4	0	1
Professors of Industrial Education	6	6	0	0
Representatives from Community Colleges	5	5	0	0
Representatives from Technical Institutes	5	3	1	1
Vocational Directors	3	1	1	1
Superintendents	3	3	0	0
Principals	5	3	1	1
Total	42	33	3	6

Although there seemed to be less agreement about this aim for the community colleges and technical institutes than there was for sub-items (a) or (b), Table 6 does show that most of the interviewees favored providing such basic training for the non-apprenticed trades.

Some selected explanations supporting the response "very important aim" were:

From a Superintendent:

> If the stated purpose of these institutions is to provide a continuing education for the people who live and work in the community, then it seems to me that providing instruction of this type is just as important as providing for any other community need that so closely affects the welfare of the people.

From a Vocational Director:

> For many years the public has strongly supported advanced education at the university level. Since I feel that we owe the same consideration to the people who cannot attend college as we give those who do, I am convinced that we not only ought to provide this instruction at this level, but that actually we are obliged to do so.

Here are some selected explanations that are typical of these from Vocational Directors, Principals, and Representative of Technical Institutes, who responded with the "not important" response to sub-item (c).

> I think that these institutions are doing this now, but it seems to me that the senior high school should be providing most of this preparation.

> This is the responsibility of the adult education program in my community and I think it ought to stay there.

The following response is from one of the two interviewees who took a "not certain" position in respect to this item (13c).

> There are probably other agencies that could do a better job of this. Perhaps we should try to force these occupations to establish formal apprenticeships and provide the instruction in that way.

A Conclusion Drawn in Respect to Item 13(c)

Although the basic training for the non-apprenticed trades should be provided by the community college or technical institute, there are other ways, equally as good, of providing such instruction.

13d. To provide essential technical courses in manufacturing processes (engineering shop), engineering graphics, mechanical technology, electricity-electronics, etc. for those students enrolled in college transfer programs leading to further professional preparation and a degree (such as engineering or with a major in industrial education).

TABLE 7 -- CATEGORICAL RESPONSES REGARDING THE ESSENTIAL TECHNICAL COURSES FOR STUDENTS ENROLLED IN COLLEGE TRANSFER PROGRAMS IN THE COMMUNITY COLLEGES OR TECHNICAL INSTITUTES

Category of Interviewees	Number of Interviewees	Very Important Aim	Not Important	Not Certain
Representatives from Industry and Business	5	5	0	0
Representatives from Labor	5	4	0	1
Vocational Education Leaders in Michigan	5	2	3	0
Professors of Industrial Education	6	5	0	1
Representatives from Community Colleges	5	5	0	0
Representatives from Technical Institutes	5	2	1	2
Vocational Directors	3	3	0	0
Superintendents	2	1	0	1
Principals	5	4	1	0
Total	41	31	5	5

Table 7, which is concerned with the responses regarding technical courses for college transfer purposes, shows a good deal less agreement among the interviewees on this issue than there was for the other proposed programs at these institutions. It is interesting to note that the Representatives from Community Colleges, in whose institutions such college transfer programs are now generally available, unanimously supported the response "very important aim." In contrast to this, the Representatives from Technical Institutes, in whose institutions where there is far less provision for college transfer programs, indicated a much more diverse response about the importance of this aim, as shown in Table 7. Following are two typical explanations for the "very important aim" response to sub-item (13d).

A Principal expressed his opinion this way:

> Most of the four-year institutions are so pressed by the increasing number of students who desire a college education that it is obvious to me that the community colleges or technical institutes can perform a most valuable service by providing a part of the student's education leading to a degree.

This position was further supported by a Representative from Labor who said:

> Such preparation is needed. The community colleges and technical institutes have the facilities, staff, and capability to help do the job, therefore, I see no reason why this should not be done in these institutions.

In contrast to this viewpoint, however, some of the interviewees selected the response "not important" as evidenced by the following typical explanations from a Representative from a Technical Institute and a Vocational Education Leader in Michigan who said:

> Normally this should not be done at this level. This preparation is better done in a four-year institution where this kind of education is a major function.

> The community college or technical institution should concern itself with programs that directly benefit the community. This means programs that do not require the completion of a formal academic degree. Some of the worth of these institutions will be lost if they become college preparatory schools. University level work should be done at a university.

The following selected explanation from a Representative from Industry and Business is typical of the reaction by those interviewees who indicated the response "not certain."

> In a way I suppose I have to agree with the statement because these institutions are doing this now. However, I have the rather strong feeling that the community colleges or technical institutes are spreading themselves pretty thin when they get into this area.

A Conclusion Drawn in Respect to Item 13(d)

> Providing technical courses for those students enrolled in college transfer programs is an appropriate function of the community college or technical institute when the four-year institution is unable to meet this need because of an excessive number of students desiring this type of preparation. Whenever possible, however, this preparation should be done at the institution offering the complete program.

14. What additional programs relating to industrial education should be provided by Michigan's community colleges or technical institutes, other than those mentioned in Item 13?

The following additional programs were suggested by more than one interviewee.

1. These institutions should offer more basic subjects such as English and elementary electricity.
2. Retraining, upgrading, and the Manpower Development Training Act programs should be conducted in these institutions.
3. More programs in industrial management should be offered.

4. These institutions should expand their programs in agriculture, food service, and horticulture.
5. More attention needs to be given to the service occupations.

In addition to the preceding list, almost all of the interviewees expressed concern that the community colleges and technical institutes should be constantly alert to the needs of the community and maintain a program sufficiently flexible to meet these needs.

15. What preparation should industrial education teachers have to provide the needed industrial education programs, at this level, in respect to:

a. liberal or general education?

While all the interviewees who responded to this item felt that these persons should have a broad background in many areas, the following two statements seem to be worthy of mention since they reflect what most of the interviewees had in mind as they responded to this question.

A Professor of Industrial Education reported that:

> These teachers should have a preparation that emphasizes a good background in communication skills as well as the sciences, mathematics, and an appreciation for the humanities. I would say about 25 to 30 per cent of the formal preparation should be devoted to the area of liberal education.

A Representative of the Community College added that:

> Certainly these persons should be as well prepared as a high school teacher. We look for people for our staff who hold the master's degree in a subject area.

A small number of the interviewees did not wish to see a specific requirement imposed regarding the amount of liberal or general education. A Vocational Leader in Michigan expressed this position:

> It is important for the good of the students that these teachers have a broad background, but it is more important that they be technically qualified. Any arbitrary amount of required work in general education could seriously limit the number of competent and technically qualified people available for such teaching positions.

15b. Professional education (courses having to do with the theory and organization of education and especially industrial education)?

Most of the interviewees felt that some professional education work was needed. However, the interviewees were not agreed as to the amount of such preparation. The statements from a Professor of Industrial Education and a Representative from Industry and Business indicate the extremes.

> It is very important that these persons have a basic foundation as teachers through directed teaching experiences and course dealing with methodology. I think about one-fifth of their preparation should be in this area.

> Some professional preparation is important, but it should be kept to an absolute minimum. One short, quick "how to" course that lasts for only a few weeks would be best.

A few of the interviewees indicated a need for this preparation but stated that this could be accomplished after the person had begun teaching.

A Representative from the Community College said:

> We don't feel that this is initially necessary. We like to provide this training through in-service courses, seminars, and consultations after the person has begun teaching.

A few even questioned the value of professional education. A Representative from Industry and Business expressed this position when he said:

> I don't think this is too important. It is my opinion that very often this preparation has little or no bearing on teaching ability.

15c. Technical preparation for teaching the designated subject?

With rather complete unanimity the interviewees agreed that the area of technical preparation was the most significant aspect for selecting teachers at this level. The two statements that follow summarize the reaction to this preparation. A Representative from a Technical Institute indicated that:

> A general background is not enough. Actual experience is a must. I would think that he should have at least two years of work experience in his field.

A Principal added the following:

> The first and foremost requisite is industrial experience. In addition he should have had sufficient advanced [college] technical course work to become skilled in his area of specialization.

16. How should educational leadership identify the subject areas necessary to develop programs that prepare technicians? This could be done
    a. from an occupational survey of placement opportunities within a community.
    b. from an occupational survey of placement opportunities within Michigan.
    c. from an occupational survey of placement opportunities within a regional area of the United States.
    d. from an occupational survey of placement opportunities throughout the entire United States.

The interviewees were asked to react to these proposed occupational surveys by indicating one of the following responses.[2]

_______ I believe this to be a sound approach.

_______ I am uncertain about this approach.

_______ This would be of little value because ...

TABLE 8 -- THE DEGREE OF AGREEMENT BY CATEGORIES REGARDING THE NEED FOR AN OCCUPATIONAL SURVEY WITHIN A COMMUNITY, MICHIGAN, A REGIONAL AREA, OR THROUGHOUT THE ENTIRE UNITED STATES

		(a)			(b)			(c)			(d)		
Category of Interviewees	Number of Interviewees	Sound Approach	Of Little Value	Uncertain	Sound Approach	Of Little Value	Uncertain	Sound Approach	Of Little Value	Uncertain	Sound Approach	Of Little Value	Uncertain
Representatives from Industry and Business	5	4	1	0	3	2	0	2	3	0	2	3	0
Representatives from Labor	5	3	2	0	3	2	0	3	2	0	5	0	0
Vocational Education Leaders in Michigan	4	3	2	0	4	1	0	4	1	0	5	0	0
Professors of Industrial Education	6	5	1	0	4	2	0	4	2	0	4	2	0
Representatives from Community Colleges	5	5	0	0	5	0	0	5	0	0	5	0	0
Representatives from Technical Institutes	5	4	1	0	4	1	0	4	1	0	4	1	0
Vocational Directors	2	2	0	0	2	0	0	1	0	1	2	0	0
Superintendents	2	2	0	0	2	0	0	2	0	0	2	0	0
Total	35	28	7	0	27	8	0	25	9	1	29	6	0

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[2] Because the interviewees dealt with the segments of Item 16 in their entirety, the reporting of the analysis of the data was done in the same way.

The preceding Table 8 shows the degree of agreement regarding the need for and extent of occupational surveys of a community, the State of Michigan, a regional area of the country, and the United States, respectively. It can be shown from these data in this table that there was a high degree of unanimity of opinion between categories for each of the proposed surveys as well as a high degree of agreement within the categories for each of the proposed surveys.

The following statements were selected to illustrate the reaction of the interviewees who selected the "sound approach" response for two or more of the four plans being suggested as the geographical area for an occupational survey.

From a Representative of Labor:

> All these different geographical areas for a survey, including a projection of future needs, should be considered. Many industries are world-wide in scope and doing just one of the surveys suggested would not give an accurate picture.

A Professor of Industrial Education said:

> It would be "naive" to believe that a localized survey would reveal more than general information. It is impossible to know how far the graduate may be located from the school where he received his training. Also, we must be careful not to base the entire program on just the survey. Any one of these types of surveys just shows the here and now and does not indicate future needs.

A Representative from a Community College added:

> These surveys should be done with the help and cooperation of advisory committees composed of representatives from labor, industry, and community to be of maximum use.

Another Representative from a Community College pointed out that:

> These surveys are of the greatest value when they are directed at occupational clusters rather than at an individual occupation. This approach gives a better indication of future needs.

An explanation from a Vocational Education Leader in Michigan suggested that there was little value in continuing the local survey of occupations:

> A survey of the local community is of little value today. The population is so mobile that we cannot restrict job opportunities to a given locale.

A Representative from the Technical Institutes even questioned having a state serve as the geographical base for an occupational survey.

> Our population is so migratory that consideration of just Michigan's needs is fool hardy and provincial.

Another Representative from the Technical Institutes, who reacted to plans (a) and (b) under Item 16 with a response "of little value" said:

> Although we need to keep in mind that people do frequently move, I think our primary obligation is to the community and the State of Michigan.

A Conclusion and an Observation Drawn from Responses to Item 16

A Conclusion:

> Occupational surveys that reflect the current and projected needs of the community, the State of Michigan, regional areas, and the entire United States should be made and considered when establishing programs in the community colleges and technical institutes in this state.

An Observation:

1. Occupational surveys should be focused on an occupational cluster rather than individual occupations.
2. The needs of a smaller geographical area, such as a local community, are becoming less important and are being supplanted by the projected needs of a wider geographical area.

17. Is it possible that the needed industrial education teachers for Michigan's community colleges and technical schools could be identified and selected from those who may now be qualified and presently teaching at other levels?

TABLE 9 -- CATEGORICAL RESPONSES TO THE POSSIBILITY OF RECRUITING COMMUNITY COLLEGE OR TECHNICAL INSTITUTE TEACHERS FROM OTHER LEVELS OF EDUCATION

Category of Interviewees	Number of Interviewees	Yes	No
Representatives from Industry and Business	5	3	2
Representatives from Labor	5	4	1
Vocational Education Leaders in Michigan	4	3	1
Professors of Industrial Education	6	5	1
Representatives from Community Colleges	5	5	0
Representatives from Technical Institutes	5	4	1
Vocational Directors	3	2	1
Superintendents	3	2	1
Total	37	29	8

Table 9 shows how the interviewees reacted to the possibility of recruiting industrial education teachers for the community colleges and technical institutes from those teaching at other levels. It is interesting to note that in three categories ; Vocational Education Leaders in Michigan, Representatives from Community Colleges, and Representatives from Technical Institutes ; where their responsibilities are closely related to the community college and technical institute, there was a rather high degree of agreement indicating that these needed teachers might be recruited in this way.

Some typical explanations from three or more categories that selected the "yes" response were:

From a Vocational Education Leader in Michigan:

> I see no reason why not. Although you would probably have to up-date some of their skills.

A Representative of a Community College indicated:

> Yes, they could be recruited this way, but only if they are specialists in a definite subject ; and that to me means plenty of industrial experience.

These explanations were selected from the Representatives from Labor and Superintendents to reflect the typical responses from those interviewees who indicated a "no" response.

> I don't think these teachers would be adequate. Generally speaking, these people lack sufficient industrial experience and up-to-date knowledge. I think that they would require so much training and up-dating that it would be economically unsound to do this. However, if a person is recently from industry and has met all qualifications, obviously you would hire him. I think that such a person who would be qualified and with enough recent industrial experience would be a coincidence.

> The teachers of academic subjects could probably be recruited this way, but I don't think that the industrial education teachers could be to any large degree. Too many just don't have the perception of the whole educational structure to adjust to this change. Besides, we need industrial education teachers at all levels. If we took teachers from the high schools, we would be "robbing Peter to pay Paul."

A Conclusion and an Observation Drawn from Responses to Item 17

A Conclusion:

It is possible to recruit industrial education teachers to teach in the community colleges or technical institutes from those who are teaching at other levels provided they are given the necessary up-grading or up-dating to make them qualified and competent.

An Observation:

There is such a shortage of industrial education teachers at all levels that it seems unsound to aggravate a short supply at one level to alleviate a shortage at the community college or technical institute level.

PART D -- OUT-OF-SCHOOL YOUTH AND ADULTS

18. Industrial education programs are needed in public schools to:

(a) provide training opportunities in industrial occupations for out-of-school youth and adults who need to acquire salable skills to enter employment.

(b) provide occupational retraining for those workers whose skills have been displaced by automation or are becoming obsolete.

(c) provide needed upgrading and updating courses for technicians, skilled mechanics, engineers, or those in industrial supervision with emphasis given to developing greater competency and the improvement of existing skills.

(d) develop competencies with the common hand and machine tools needed for the maintenance of homes.

(e) provide organized instruction for persons who would like to meet and work together on common hobbies relative to industrial activities.

TABLE 10 -- RESPONSES BY CATEGORIES TO PROGRAMS PROPOSED FOR OUT-OF-SCHOOL YOUTH AND ADULTS AS THEY RELATE TO BEING A RESPONSIBILITY OF PUBLIC EDUCATION

		(a)			(b)			(c)			(d)			(e)		
Category of Interviewees	Number of Interviewees	Agree	Not Responsible	Not Certain	Agree	Not Responsible	Not Certain	Agree	Not Responsible	Not Certain	Agree	Not Responsible	Not Certain	Agree	Not Responsible	Not Certain
Representatives from Industry and Business	5	4	1	0	4	1	0	4	1	0	3	2	0	3	2	0
Representatives from Labor	5	3	2	0	3	1	1	3	2	0	3	2	0	2	3	0
Vocational Education Leaders in Michigan	5	5	0	0	5	0	0	4	1	0	3	2	0	2	3	0
Professors of Industrial Education	6	6	0	0	6	0	0	5	1	0	4	2	0	6	0	0
Representatives from Community Colleges	5	5	0	0	5	0	0	5	0	0	4	1	0	3	2	0
Representatives from Technical Institutes	5	4	0	1	4	0	1	1	3	1	1	3	1	1	4	0
Vocational Directors	5	5	0	0	4	0	1	5	0	0	4	1	0	2	3	0
Superintendents	5	3	2	0	3	2	0	3	2	0	2	3	0	2	3	0
Total	41	35	5	1	34	4	3	30	10	1	24	16	1	21	20	0

Key:

(a) For salable skills
(b) Retraining
(c) Develop greater competency
(d) For maintenance of homes
(e) Common hobby interests

Table 10 shows the responses of the categories of interviewees to proposed programs, as suggested by proposals (a) through (e), needed for out-of-school youth and adults. The interviewees were asked to react to these programs by selecting one of the following responses:

______ This should not be the responsibility of public education.

______ I agree.

______ I am not certain.

______ My reaction to this is...

The data in Table 10 indicate a rather uniform opinion regarding proposals (a), (b), and (c) with less agreement regarding proposals (d) and (e).

It is interesting to note that of the 205 possible total responses only five persons indicated that they were "not certain" regarding these proposed plans.

The succeeding sections report selected responses for each of the proposals (a) through (e) for Item 18:

18a. Provide training opportunities in industrial occupations for out-of-school youth and adults who need to acquire salable skills to enter employment.

The following explanations for the "I agree" response are typical of those given by a majority of the interviewees:

From a Representative of Industry and Business:

> We haven't given enough attention to this group. These people are a responsibility of society.

A Vocational Leader added that:

> Industry is turning to the schools for help in this area. As a functioning arm of society we are obliged to help.

A Professor of Industrial Education pointed out:

> Formalizing the education process helps to provide good citizens. These people want to become contributing members of society rather than being a liability.

A Representative of Labor cautioned that:

> I agree, but we do need to have state, federal, and industrial assistance with these programs so that the effectiveness of the other aspects of public education will not be impaired.

The following explanation selected was to support the thinking for "this is not the responsibility of public education" response indicated by interviewees representing Industry and Business, Labor, and Superintendents.

> I believe we need emphasis and financial support for the in-school youth before public education can begin to really take care of anyone else. We do not presently have adequate funds for our current programs much less to try and spread the money even thinner by structuring additional programs.

18b. Provide occupational re-training for those workers whose skills have been displaced by automation or are becoming obsolete.

A majority of the interviewees who responded to proposal (b) indicated that they agreed that public education should provide occupational re-training. To support this position a Vocational Education Leader said:

> I agree; this is one of the keys to the employment problems that besets us. By re-training those workers who have a potential for technician level work, we can move everyone up the "skill ladder." This would then make job opportunities available to persons of lesser ability and who would otherwise probably be unemployed and on public welfare.

Among those who indicated "this is not the responsibility of public education" was this typical statement:

From a Representative from Industry and Business:

> It is an industry responsibility to re-train or find new jobs for these people.

13c. Provide needed up-grading and up-dating courses for technicians, skilled mechanics, engineers, or those in industrial supervision with emphasis given to developing greater competency and the improvement of existing skills.

Here are typical explanations made by a majority of the interviewees in support of their response "I agree":

> This should be encouraged. The cost of such a program is a factor, but these courses tend to be self-supporting.

A Representative from a Community College added:

> I agree, but these programs should be self-supporting or underwritten by industry. Many companies do reimburse their employees who are upgrading themselves.

A response from a Professor of Industrial Education was similar to those made by persons indicating that "this is not the responsibility of public education" below the community college level.

> The type of program is best handled by the community college or the four-year institution. I think these people ought to be a little more individually responsible for their improvement than would be the case with some of the other programs.

18d. Develop competencies with the common hand and machine tools needed for the maintenance of homes.

The following are typical explanations for the "I agree" response from a majority of the interviewees.

A Professor of Industrial Education said:

> Yes, I think public education could do some of this. It is just as important as health or safety education.

A Representative from a Community College pointed out:

> If this type of program is offered as a regular part of the senior high program, I think it would be good. After high school it should be entirely self-supporting.

In contrast to these positions a number of the interviewees selected the "this is not the responsibility of public education" response and commented in the following manner.

A Vocational Education Leader indicated:

> No, this is a luxury item. We must first take care of our basic vocational training needs.

A Representative from a Technical Institute added:

> A lot of public money is wasted this way. There are many other ways that this information is available. Besides, to get this work done skillfully, the homeowner should probably hire someone who knows what he is doing.

18e. Provide organized instruction for persons who would like to meet and work together on common hobbies relative to industrial activities.

Proposal (e) of Item 18 represents the greatest difference of opinion in the five proposals for out-of-school youth and adults. The following statements were selected as being representative of typical explanations for the responses.

An "I agree" response from a Professor of Industrial Education was:

> As an advancing technology provides more and more leisure time, it is important that the schools help persons become occupied in purposeful and meaningful activities.

A Superintendent added:

This is "okay" if such instruction could pay its own way.

"This is not the responsibility of public education" as suggested in responses from a Representative from Labor and from a Vocational Director:

> No! Public education simply cannot financially afford to do it.
>
> This is really part of a recreation program just like softball or bridge. It almost becomes therapeutic and probably has little or nothing to do with industrial education.

Conclusions and Observations Drawn from Responses to Item 18

Conclusions:

1. It is a responsibility of public education to provide training opportunities for out-of-school youth and adults to acquire a salable skill.
2. Public education, with the close cooperation of industry, should provide occupational re-training whenever needed.
3. Secondary schools have a responsibility for providing up-dating and up-grading courses when these opportunities are not available at a community college or technical institute.
4. Public education should undertake programs to promote the maintenance of homes, but only after the more pressing needs for vocational preparation have been provided.
5. Public education should assist and cooperate with recreation programs and other social agencies in providing for common hobby interests related to industrial activities.
6. Persons who participate in vocational education programs for out-of-school youth and adults should assume a portion (and in some cases all) of the costs of conducting such programs.

Observations:

1. Industry should assume (and often has assumed in the past) an active, vigorous participation within a community in programs designed to provide for highly specialized: initial preparation, re-training, and up-dating and up-grading of the work force.
2. The degree to which the public schools (as a social agency) have been responsible for providing programs for out-of-school youth and adults has been related to the amount of money and the number of facilities that have been made available by the community, state, and nation for public education.

19. It has proven difficult, and sometimes impossible, to recruit industrial education teachers for programs under the Manpower Development and Training Act, like (a) engine-turret lathe operator, (b) floor assembler, (c) automatic screw machine set-up man, (d) transmission and differential mechanic, (e) auto-body repairman, (f) ignition and carburetion mechanic, (g) brake mechanic, (h) motor adjuster, (i) automobile painter, (j) lumber grader, (k) combination welder, and (l) bulldozer operator. How could qualified industrial education teachers be identified and recruited to staff these programs?

With three exceptions the consensus of the interviewees was that this was not a realistic recruitment practice, because industrial education teachers would not be qualified in the areas needed. The interviewees felt that it was not a matter of an inadequate number of the teachers so much as it was simply a lack of specialized training. This position was substantiated by this typical remark from a Representative of a Community College who said:

> The teacher's preparation is rightly a rather broad coverage. Even his specialty is probably a broad coverage of a narrow field such as drafting or machine shop. On the other hand the MDTA programs deal with such a narrow, well defined occupation that only a person who is doing this specific job today can really be called qualified. Besides, it is not very likely that you would find many teachers who had been bulldozer operators, or experts in the other occupations mentioned.

Some other comments relating to Item 19 were:

> This whole program is too politically oriented. It would have been better if more educators had been consulted about the original bill.
>
> We're going to have trouble getting teachers for this program as long as it is considered a crash program. It should be put on a more permanent basis. Then we could actually prepare teachers to fill this need.

Conclusion and Observations Drawn from the Responses to Item 19

Conclusion:

> It is not realistic to recruit practicing industrial education teachers for programs under the Manpower Development and Training Act within the framework of the present organizational and administrative structure.

Observations:

1. It is unlikely that a typical industrial education teacher would be technically qualified for the occupations currently taught in the Manpower program.
2. The "crash" aspects of the Manpower Development and Training Act program should be eliminated and the program put on a more stable, long-term basis to deal with the problems of unemployment and retraining.

20. Would it be practical to develop a list of potential teachers (persons presently in industry) who have the needed work experience in the occupational area, adequate education (secondary or beyond), and an interest in teaching for the Manpower Training program?

TABLE 11 -- THE DEGREE OF AGREEMENT REGARDING THE IDENTIFICATION OF PERSONS AS POTENTIAL TEACHERS FOR MANPOWER TRAINING

Category of Interviewees	Number of Interviewees	I Think So	This Is Not Practical
Representatives from Industry and Business	5	5	0
Representatives from Labor	5	5	0
Vocational Education Leaders in Michigan	5	5	0
Professors of Industrial Education	6	6	0
Industrial Education Teachers	5	5	0
Representatives from Community Colleges	5	5	0
Representatives from Technical Institutes	5	5	0
Vocational Directors	5	4	1
Total	41	40	1

The data in Table 11 shows that the interviewees consider it practical to develop a list of potential teachers to participate in a manpower training program. There was just one exception to unanimous support for the development of such a list.

The Vocational Director who said, "This is not practical," gave this explanation:

> I question if this is practical. It would take so much time to locate these persons that by the time they were identified they very likely wouldn't be needed.

Those who indicated the "I think so" response further reacted to succeeding questions (a) through (d). The following compilation covers their suggestions and recommendations:

20a. If so, how could these industrial persons be identified and recruited for these programs?

1. By advertising in newspapers, trade journals, and union publications.
2. Using the recommendations of advisory committees composed of representatives of labor and management.
3. Through the contacts of the Michigan Employment Security Commission, interested craftsmen might be approached for work in this program.
4. By contacting recently retired persons who desire a limited amount of work.
5. By working through management, personnel inventories might be taken and persons with the necessary skills identified.
6. The Department of Public Instruction could maintain an index file of such persons through its industrial contacts.
7. Industrial training directors could make recommendations.

20b. What should be the character and extent of the industrial work experience needed by such persons?

1. He should be a journeyman or its equivalent.
2. He should be capable of holding the job in industry for which he is training people.
3. He should possess a number of years actual experience in the occupation for which training is to be given, perhaps as much as ten years.
4. He should fulfill the same minimum technical requirements as are required for vocational certification by the State of Michigan.

20c. What should be the extent and nature of the professional college preparation that should be given to these persons after they have been identified?

The following statement from a Representative from Labor summarizes the principal viewpoint expressed by the interviewees.

> In addition to being able to communicate an idea, a person who is to teach in one of these special programs should have some formal instruction in teaching methods and the organization of course materials. This instruction should be short, to the point, and deal only with the things he can actually use. This probably could best be done on an in-service basis.

A Professor of Industrial Education who agreed with the preceding recommendations suggested further that the manpower program be organized with a "team-teaching" approach.

> We could take also the craftsman from industry and have him work cooperatively with a professional educator whose responsibilities would include helping the craftsman organize his instruction, constructing teaching aids and devices, and evaluating the performance of the students.

20d. What should be the minimum formal college education required of these teachers for the Manpower Training program?

A very large majority of the interviewees indicated that unless these persons intended becoming regularly certified teachers for one of the permanent programs, there should be no minimum formal college education required. This did not preclude the desirability of trying to locate qualified people who did have some college background. One Professor of Industrial Education qualified his position with respect to the need for some college background when he indicated:

> I do think that these people should have the same capability in reading, writing, and mathematics as we expect of college freshmen.

A Vocational Director added:

> In my opinion, they should have one year of college or its equivalent.

UPGRADING INDUSTRIAL EDUCATION TEACHERS

21. What changes would you advocate in the present Michigan State Certification Code in respect to industrial education teachers (regular and vocational certification)?

Many of the interviewees chose not to comment specifically on the Certification Code. They gave as the reason that either they were not qualified to comment or that they were not sufficiently cognizant of specific and prevailing requirements. The following remarks represent the changes or revisions recommended by the interviewees who did respond to this question regarding an examination or evaluation of the code.

A Principal said:

> The whole field of certification is too fragmented. We have too many special kinds of certificates. It is difficult to talk about "what is a certified teacher."

Another Principal recommended that:

> All industrial education teachers should be required to have industrial experience.

A Professor of Industrial Education called for an examination of the code when he remarked:

> For too long now we have operated with the notion that the only good teachers were those who had degrees and certificates. We must open the doors in vocational education to those people in industry and business who have so much knowledge and experience for our students.

Another Professor of Industrial Education suggested:

I would like to see the code revised so that only persons with majors (specialization) in industrial education would be employed to teach. We have a number of people teaching industrial arts who have just minors or less in this field.

A Teacher of Industrial Education recommended:

Industrial education teachers should be required to pass competency examinations or tests given by a State Board. There should be work experience, also, required of these teachers.

A Representative from a Community College indicated:

The universities should stiffen their standards and include more technical competency courses before recommending anyone for certification.

A Vocational Director made these recommendations:

Many of the so-called methods classes (professional education courses) should be eliminated or compressed into more efficient instructional units. This would then probably provide time for industrial experience as a part of the teacher's preparation.

Another Vocational Director would like to see:

Industrial education teachers for community colleges or technical institutes certified in the same way as other public school teachers.

A Superintendent suggested that:

Every four or five years industrial education teachers should be required to work in industry to up-date themselves.

Observations Made with Respect to Item 21

1. More people need to be made aware of the specific requirements for certification in the State of Michigan.

2. Some industrial experience should be required of all industrial education teachers.

3. Greater provision should be made in the certification code for persons who do not currently meet all the certificate requirements but possess other important or desirable characteristics such as industrial experience, advanced specialized training, or unique experiences valuable to the educational systems.

22. What should be the responsibility of the individual industrial education teacher for maintaining his technical competency?

The following suggestions or recommendations for maintaining technical competency were compiled from the responses of the interviewees to Item 22.

An industrial education teacher is responsible for maintaining his technical competency by:

a. participating in industrial-sponsored training courses.

b. frequently visiting industrial shops, laboratories, and other appropriate facilities.

c. taking advanced technical courses at the university level.

d. attending pertinent conventions, meetings, seminars, and in-service conferences.

e. belonging to and participating in professional organizations.

f. obtaining employment in industry during the summer months.

g. reading technical journals and other appropriate literature.

h. applying for and studying under grants such as provided by the National Science Foundation.

i. experimenting and practicing with an application of technical developments in home, school shop, or laboratory.

23. What specific policies, practices, or programs could a school system establish to help keep industrial education teachers competent?

The following suggestions and recommendations were frequently mentioned by the interviewees in response to Item 23.

The specific policies, practices, or programs that could be established by school systems to help keep industrial education teachers competent are to:

a. provide funds to help underwrite the cost of teachers' attendance at conventions and meetings outside of the school system.

b. give salary recognition for industrial experience.

c. conduct in-service workshops, conferences, seminars, and other meetings.

d. provide released time for teachers to gain industrial experiences.

e. provide released time for teachers to make industrial visitations.

f. give salary recognition for increased competency as evidenced by the suggestions and recommendations in the data for Item 22.

g. structure the teaching situation so that teachers are encouraged to maintain their own competency by fulfilling the recommendations made in response to Item 22.

24. What should be the responsibility of the State Department of Public Instruction in establishing or arranging for institutes to improve industrial teacher competency?

The following explanations summarize the responses by those interviewees asked to react to Item 24.

From a Vocational Director:

> The State Department of Public Instruction is limited by the amount of money available. To the extent these funds will permit, however, the DPI should arrange institutes and meetings of interest to all the industrial education teachers in the state.

Another added:

> The state's role should be one of leadership. It should be inspirational and supervisory to the extent that they make arrangements for pertinent conferences and meetings.

A Professor of Industrial Education remarked that:

> The Department of Public Instruction should coordinate the work of the universities and the local school systems. They ought to be the catalysts that get school systems to require (or more strongly encourage) teachers to keep themselves up-to-date.

A Principal further pointed out that:

> The DPI has done a good job in the past. It does need to do two additional things, however. The first is to provide more local institutes and conferences than it has in the past. The second is to make a stronger appeal to teachers who presently do not attend the current programs and meetings.

A Conclusion and an Observation Drawn from the Responses to Item 24

A Conclusion:

> The Department of Public Instruction's primary role in arranging institutes for improving industrial teacher competence is that of serving in an advisory and consultative capacity as it encourages the universities and school systems to arrange opportunities for teacher improvement.

An Observation:

> Currently, the Michigan Department of Public Instruction does not have adequate funds for an optimum program of motivating and assisting the school systems and the universities with seminars, grants-in-aid for conferences and research study, as such practices might be employed to improve industrial teacher competency. The people of Michigan, through their elected representatives, need to more adequately assume and to provide for this responsibility.

25. Please list specific institutes or training programs that are now available to industrial education teachers.

The data collected for this item has been compiled and included in this report as Appendix E , appearing on page 101

CONSIDERATIONS FOR EXTENDING INDUSTRIAL EDUCATION PROGRAMS

26. Should students be employed by the public schools or municipal agencies, such as the Board of Water Commissioners or the Department of Building and Safety Engineering of a city, for a meaningful work experience basic to the development of a salable skill?

TABLE 12 -- DEGREE OF AGREEMENT REGARDING EMPLOYMENT OF YOUTH BY MUNICIPAL AGENCIES OR BOARDS OF EDUCATION, FOR DEVELOPMENT OF A SALABLE SKILL

Category of Interviewees	Number of Interviewees	A Sound Approach	Impractical	Uncertain or Did Not Comment
Representatives from Industry and Business	5	4	1	0
Representatives from Labor	5	5	0	0
Vocational Education Leaders in Michigan	5	5	0	0
Professors of Industrial Education	6	3	3	0
Industrial Education Teachers	5	3	2	0
Representatives from Community Colleges	5	5	0	0
Representatives from Technical Institutes	5	3	1	1
Vocational Directors	5	4	0	1
Superintendents	5	5	0	0
Principals	5	4	1	0
Counselors	5	2	3	0
Total	56	43	11	2

Table 12 reports the data in respect to the practicality of boards of education and municipal agencies employing industrial education students for a meaningful work experience. This possibility of having the community provide experiences which are currently unavailable to youth in industry, either because of the scarcity of jobs or the restrictions of industrial-work regulations, is now being given careful consideration in many experimental programs throughout the United States organized to cope with the youth employment problem. It should be noted, too, that persons who were asked to respond to this proposal preferred not to comment or were not certain, even though the provision for this response was not included on the interview instrument.

The following explanations are typical of those who said this is "a sound approach" in response to Item 26:

> From a Representative from Industry:
>
> This is a sound approach. It would greatly help a youth explore an area of work and find out if he really likes it. The child labor laws might be somewhat of a problem though.
>
> From a Representative from Labor:
>
> In some cases it would be practical. Committees from industry, labor, and the local school board could cooperatively survey the agencies to determine possible jobs, pay, hours, and conditions suitable for these young people. It is important, though, that any such arrangement should provide for a sound educational experience and not simply employment.
>
> A Vocational Education Leader added:
>
> Yes, this is sound. Currently arrangements are being made under the Manpower Development and Training Act to do something very much like this. Federal assistance is needed for these programs.

Among those who gave the "impractical" response the following remarks were typical:

> A Principal said that:
>
> This is impractical. Between the problems with the unions and the child-work laws in Michigan, very little of this could be done that would have any real value.

An Industrial Education Teacher added:

This proposal is impractical because the experiences the student would have would very likely be routine in nature and far too narrow to do him much good.

Conclusion and Observations
Drawn from the Responses to Item 26

Conclusion:

Through the cooperation of industry, labor, and the local school system, students could be employed by the school or other municipal agencies in providing for a controlled and meaningful work-study experience.

Observations:

1. State labor laws that affect minors need to be re-examined and provisions made for school-sponsored experiences that could be a significant part of a young person's education.

2. There is a need for more Federal monies to facilitate more such programs.

27. Would it be functional and practical to develop a program that would provide for a selected industrial education student to have a controlled on-the-job work experiences with a selected craftsman, technician, or engineer in a specific industry?

TABLE 13 -- ON-THE-JOB WORK EXPERIENCE WITH A SELECTED CRAFTSMAN, TECHNICIAN, OR ENGINEER FOR AN INDUSTRIAL EDUCATION STUDENT

Category of Interviewees	Number of Interviewees	A Sound Approach	Impractical	Uncertain or Did Not Comment
Representatives from Industry and Business	5	1	4	0
Representatives from Labor	5	3	1	1
Vocational Education Leaders in Michigan	5	3	2	0
Professors of Industrial Education	6	5	1	0
Industrial Education Teachers	5	3	2	0
Representatives from Community Colleges	5	0	5	0
Representatives from Technical Institutes	5	0	3	2
Vocational Directors	5	0	4	1
Superintendents	5	3	2	0
Principals	5	4	1	0
Counselors	5	1	3	1
Total	56	23	28	5

Table 13 shows that the interviewees are in disagreement as to the practicality of having an industrial education student have an on-the-job work experience as he would be closely associated with a selected craftsman, technician, or engineer. The interviewees who were closely associated with junior or senior high school education, however, indicated a more favorable response than those whose work deals with post-high school programs. The interviewees from the Representatives from Community Colleges and Technical Institutes unanimously thought the proposal to be impractical.

The following statements from the Professors of Industrial Education, Superintendents and Principals categories illustrate the typical explanations for the response "sound approach."

> This idea is worth exploring. It has some real possibilities for advanced students. This would be one of the great forward steps in industrial education.
>
> This is an ideal to be approached. This kind of experience should spread to other occupational training subject areas [business education and cosmetology were cited as examples].
>
> This is a strong sound approach for the following reasons:
>
> 1. It would give the student direct supervision.
> 2. The student would learn something specific.
> 3. The selected person would take pride in training the student and, therefore, the student would derive benefit from and perhaps imitate a wholesome positive attitude toward work.

In contrast to this position, the interviewees who indicated the "impractical" response would argue in terms of the following typical remarks that were made by the Representatives from Community Colleges, Technical Institutes, and Vocational Directors:

> Impractical. This proposal is not realistic in terms of our modern technology and the "team" approach to manufacturing.
>
> The very limited experience a student would receive and the high cost to industry of freeing one man that long make this idea seem highly impractical.
>
> The age of the student and the other legal restrictions make this proposal very impractical.
>
> This is far too costly an idea for industry to endorse. The present cooperative program is more realistic.

A Conclusion Drawn from the Responses to Item 27

> There is some question regarding the practicality of providing industrial education students an on-the-job work experience with just one selected craftsman, technician, or engineer because of the high cost to industry and the possibility of the student's experience being too narrow and limited in scope.

28. Is the principle of team-teaching applicable to industrial education?

TABLE 14 -- DEGREE OF AGREEMENT REGARDING THE APPLICATION OF THE PRINCIPLE OF TEAM TEACHING TO INDUSTRIAL EDUCATION

Category of Interviewees	Number of Interviewees	Yes	No	Not Certain or Did Not Comment
Vocational Education Leaders in Michigan	5	3	2	0
Professors of Industrial Education	6	5	0	1
Industrial Education Teachers	5	4	0	1
Vocational Directors	5	1	2	2
Superintendents	5	4	1	0
Principals	5	5	0	0
Total	31	22	5	4

Table 14 shows the degree to which the interviewees agreed that the principle of "team-teaching" could be applied to industrial education. The Vocational Directors category was the only one in which most of the interviewees did not favor "team-teaching" for industrial education.

Of those who indicated a "yes" response the following comments from selected interviewees are typical explanations.

> Yes, I think it is applicable. It would be especially good if there were an industrially trained man and a professional educator in the classroom.
>
> I am in favor of it. It is a realistic solution to the problem of spreading the technical background of teachers too thin.
>
> Yes -- a blessing to the small school that cannot economically justify a specialist in each area of the program.
>
> This is certainly possible. However, I would want to be sure that the group could be split for more individualized instruction and assistance for small group demonstrations and discussions .

"No" was the response indicated by three of the interviewees. This response represents their viewpoint:

> I am not greatly impressed with the results I have seen. This is particularly true for advanced depth classes. If the teacher does not have sufficient background to provide the instruction, perhaps he should not be teaching the subject. Inviting guest experts from industry to talk to the class would be of more value to the students than having another teacher come in.

Conclusion and Observations Drawn from the Responses to Item 28

Conclusion:

> The principles of team-teaching are applicable to industrial education.

Observations:

1. Many of those who favored team-teaching for industrial education did so because they thought that it could well be the approach for providing the large number of specialized persons (technicians to assist professional teachers) needed for the expanded program of occupational education.
2. The actual structure of the team approach would vary from situation to situation, and no one form would be considered uniquely appropriate for industrial education.

29. How should Michigan's industrial education programs at the senior high school level be best organized to prepare individuals to service the products of industry?

The interviewees who were asked to respond to Item 29 were about evenly split regarding the approach for organizing such instruction. There were those who advocate that the instruction be organized as separate courses to prepare individuals to service the products of industry; others recommend that this be done through units of instruction that would be an integral part of present courses.

The following remarks are typical of those interviewees who would favor separate courses.

From a Vocational Education Leader:

> The best way to organize this instruction would be through an area vocational school where students could specialize in servicing specific industrial products.

And another added:

> With well-qualified teachers, carefully selected equipment, and a flexible adaptable program, a good job of presenting this instruction could be provided.

A Professor of Industrial Education commented that:

> Short courses with the actual products would be the best way to organize this instruction.

A Representative from Industry and Business indicated:

> The schools should provide basic instruction. Industry, through the service departments, could provide the opportunity for a cooperative program to prepare these people.

Those interviewees who favored having the service instruction a part of present courses gave the following explanations for their position.

From a Professor of Industrial Education:

> Highly specialized, detailed courses in the servicing of industrial products would be too narrow and limited. The general principles about mechanisms should be taught in[public schools] so students are prepared to transfer that information to any device.

Another Professor added:

> Specialized instruction in servicing is the responsibility of industry. The schools can only teach the general principles.

A Vocational Director pointed out:

> The schools role in providing this instruction should be to emphasize the related information and problem-solving procedures.

An Industrial Education Teacher said:

> This instruction should be part of our present manipulative courses. The servicing of industrial products requires a basic knowledge of tools and materials just as is necessary for the areas of manufacturing or fabrication.

A few of the interviewees did not feel that any "service instruction" should be provided. The following statements from an Industrial Education Teacher expresses this viewpoint.

> We should drop service work completely. We are trying to do too much now. This instruction should be obtained through an apprentice program or in-factory training courses.

Conclusions and an Observation
Drawn from Responses to Item 29

Conclusions:

1. Attention should be given to service training at the secondary school level.
2. Service training could be specialized if the schools are able to provide a competent teacher and if industry is willing to provide the needed equipment or a cooperative training opportunity. If facilities and staff are not available, then service units of instruction should be integrated as an integral part of the regular industrial education courses.

An Observation:

> This area of instruction needs to be expanded as the opportunities in service occupations expand.

PART C

RECOMMENDATIONS FOR ADDITIONAL ACTION PROGRAMS AND RESEARCH STUDIES

At the time this study was first proposed, one of the important outcomes anticipated was the identification of major areas of concern to the persons interviewed. These areas of concern have been delimited to a series of specific proposals included in this report as Appendix F. These proposals represent an attempt to structure action programs that deal with what the interviewees mentioned as the shortcomings of industrial education and industrial teacher competency.

In addition to the specific proposals for additional research or study, a number of other significant issues were identified from the data collected in the interviews that need more consideration than mere mention in this report. The directors of the study anticipate that educational leadership would be sufficiently concerned with the development of occupational education to continue the work this study has undertaken by preparing and implementing additional action programs to improve industrial teacher competency and the quality of industrial education programs in Michigan.

The following then is a list of additional recommendations and questions that represent issues raised by the interviewees that require further study and consideration. The issues inherent in these questions or statements are not covered in the specific proposals that appear as Appendix F in this report.

1. To what degree should industrial work experience be required of industrial education teachers? Should this work experience be an integral part of the teacher's preparation?
2. What criteria are significant and valid for evaluating the technical competence of an industrial education teacher?
3. More critical admission procedures appear to be needed for the selection of potential industrial education teachers.
4. Should industrial education teachers be employed by school systems for twelve months a year with ten months spent teaching and two months spent working in industry or in other programs that would make it possible for these teachers to readily cope with technological advance?
5. A re-assessment and re-structuring of the organization of the school day, semester and year is required, especially for specialized programs of occupational education, to provide the opportunity for more students to be enrolled in vocational programs.
6. More definitive consideration needs to be given to what constitutes a general education.
7. A more adequate state-wide survey is needed to identify and catalog industrial teacher skills, competencies, and qualifications.
8. More programs of occupational education should be based on a projection of technological change and the needs of industry.
9. A study of desirable changes in prevailing legislation is needed to more adaquately provide for the occupational education of youth.
10. Units of instruction for programs to prepare persons for the various service occupations need to be identified and organized.

11. More adequate information is needed about the "drop-outs" from Michigan's schools.

12. The role and relationships of the projected area vocational schools to the community colleges needs to be determined.

13. More adequate testing devices and evaluation procedures are needed to assist youth in appraising aptitudes and interests for occupational opportunities to improve the guidance program through industrial education.

14. To what degree could teachers in community colleges or technical institutes be exchanged for a time with persons in industry to improve the technical depth of post-high school programs.

APPENDIXES

A - CATEGORICAL LISTING OF THE INTERVIEWEES

B - ROSTER OF TASK FORCE ONE

C - THE INTERVIEW INSTRUMENT

D - SPECIFIC ITEMS OF INTERVIEW INSTRUMENT THAT WERE ANSWERED BY RESPONDENTS IN EACH CATEGORY

E - INDUSTRIAL TRAINING FACILITIES AND COURSES AVAILABLE TO INDUSTRIAL EDUCATION TEACHERS

F - SPECIFIC PROPOSALS FOR ACTION PROGRAMS AND RESEARCH STUDIES

APPENDIX A

SELECTED PERSONS CLASSIFIED BY GROUPS TO RECEIVE INVITATIONS TO BE INTERVIEWED

Superintendents

1. Dr. Carl Byerly
Detroit Public Schools
5057 Woodward Avenue
Detroit, Michigan 48202

2. Ralph E. Brant
Ecorse Public Schools
27385 Outer Drive
Ecorse, Michigan 43229

3. H. J. Bothwell
Marquette Public Schools
611 North Front Street
Marquette, Michigan

4. Dr. Otto Hufziger
Superintendent
Trenton Public Schools
2603 Charlton Road
Trenton, Michigan

5. Elwyn J. Bodley
Bay City Public Schools
1800 Columbus Avenue
Bay City, Michigan

Vocational Directors

1. Herbert Olson
Traverse City Public Schools
Milliken Drive
Traverse City, Michigan

2. Erwin Wolff
Escanaba Public Schools
1219 North 19th Street
Escanaba, Michigan

3. Earl Robinson
Saginaw Public Schools
425 South Warren
Saginaw, Michigan

4. Bernard Kennedy
Grand Rapids Public Schools
143 Bostwick Avenue
Grand Rapids, Michigan

5. Carl H. Turnquist
Divisional Director
Vocational Education
Detroit Public Schools
467 West Hancock
Detroit, Michigan 48201

Principals

1. Thomas O. Quinlan
Wilbur Wright Cooperative
High School
4333 Twelfth Street
Detroit, Michigan 48208

2. Franklin E. Frey
Pershing Senior High School
18875 Ryan Road
Detroit, Michigan 48234

3. Clarence E. Benn
Butzel Junior High School
1464 East Congress
Detroit, Michigan 48207

4. Eugene S. Thomas
Central High School
714 South Westnedge
Kalamazoo, Michigan

5. Jack L. Larsen
St. Joseph Senior High School
2521 Stadium Drive
St. Joseph, Michigan

Selected Persons Classified by Groups to Receive Invitations to be Interviewed

Counselors

1. Floyd Oglesby
Battle Creek Central High School
100 West VanBuren Street
Battle Creek, Michigan

2. Kenneth Kohlberg
Muskegon High School
80 West Southern Avenue
Muskegon, Michigan

3. James Alexander
Oscoda Area Junior-Senior High School
3550 East AuSable River Road
Oscoda, Michigan

4. Keith Chapman
Battle Creek Central High School
100 West VanBuren Street
Battle Creek, Michigan

5. Kenneth Boogren
Fitzgerald Senior High School
23200 Ryan Road
Warren, Michigan

Representatives of Community Colleges

1. James H. Dotseth
Assistant Dean of Instruction for Technical Education
Schoolcraft College
9901 Newburgh Road
Livonia, Michigan

2. Robert Kollin, Assistant Dean
Henry Ford Community College
Dearborn, Michigan

3. Philip J. Gannon, Dean
Lansing Community College
419 Capitol Avenue
Lansing, Michigan

4. Clarence Haines
Technical Coordinator
Flint Junior Community College
Flint, Michigan

5. Allan E. Reed, Assistant Director
Alpena Community College
Alpena, Michigan

Representatives of Technical Institutes

1. R. E. Nauth, President
Detroit Engineering Institute, Inc.
2030 West Grand River Avenue
Detroit, Michigan 48226

2. Michael Alyea, Manager
R.E.T.S. Electronic Schools
1625 East Grand Boulevard
Detroit, Michigan 48211

3. Harold M. Dent
Director of Instruction
General Motors Institute
Flint, Michigan

4. Dr. Dewey F. Barich, President
Detroit Institute of Technology
131 East Adams
Detroit, Michigan 48226

5. Dr. Victor F. Spathelf, President
Ferris State College
Big Rapids, Michigan

Selected Persons Classified by Groups to Receive Invitations to be Interviewed

Industrial Education Teachers

1. Roy Bolles
Wilbur Wright Cooperative
High School
4333 Twelfth Street
Detroit, Michigan 48208

2. Frederick W. Lamb
2079 East McLean
Flint 7, Michigan

3. Earl O. Phillips
11348 Fielding
Detroit, Michigan 48228

4. Uno A. Suomela
Charlevoix Public Schools
Charlevoix, Michigan

5. Sam George
Reed City High School
Reed City, Michigan

Professors of Industrial Education

1. Dr. Blair C. MacLean
College of Education
Michigan State University
East Lansing, Michigan

2. George E. Kohrman, Dean
School of Applied Arts &
Sciences
Western Michigan University
Kalamazoo, Michigan

3. Kauko A. Wahtera, Chairman
Industrial Education Department
Northern Michigan University
Marquette, Michigan

4. Dr. Ernest L. Minelli, Prof.
Industrial Arts Department
Central Michigan University
Mount Pleasant, Michigan

5. Norman W. Risk, Assoc. Prof.
Industrial Education and
Applied Arts Department
Eastern Michigan University
Ypsilanti, Michigan

6. A.A. Vezzani, Prof.
Department of Vocational &
Practical Arts Education
School of Education
The University of Michigan
Ann Arbor, Michigan

Vocational Education Leaders in Michigan

1. Robert M. Winger
Department of Public Instruction
Division of Vocational Education
P. O. Box 928
Lansing, Michigan

2. Thomas W. McKinnon, Manager
of Salary, Personnel, and
Training Department
Industrial Relations Office
Manufacturing Services
Ford Motor Company
River Rouge, Michigan

3. Earl L. Bedell
Great Cities Project
Detroit Public Schools
453 Stimson
Detroit, Michigan 48201

4. Roland R. Fraser
Director of Manpower Training
Detroit Public Schools
5057 Woodward Avenue
Detroit, Michigan 48202

5. Bert Whalen, Supervisor
Michigan Employment Security Commission
7310 Woodward Avenue
Detroit, Michigan 48202

Selected Persons Classified by Groups to Receive Invitations to be Interviewed

Representatives from Labor

1. Nat Weinberg, Director
   Special Projects
   UAW International
   Solidarity House
   8000 East Jefferson Avenue
   Detroit, Michigan 48214

2. Joseph Tuma, Director
   Training Program
   UAW International
   Solidarity House
   8000 East Jefferson Avenue
   Detroit, Michigan 48214

3. Alex Fuller
   UAW Representative
   Wayne County Council of AFL-CIO
   Room 500, Film Exchange Building
   2310 Cass Avenue
   Detroit, Michigan 48201

4. Don Stevens
   Educational Director, AFL-CIO
   716 Lothrup
   Detroit, Michigan 48202

5. Dan Diamond, President
   Electrical Workers Union Local No. 58
   55 Adelade
   Detroit, Michigan

Representatives from Industry and Business

1. Preston Amerman
   Director of Employment & Personnel Research
   Detroit Edison Company
   2000 Second Avenue
   Detroit, Michigan 48202

2. Hoyt Logan
   Customer Relations
   Michigan Bell Telephone Company
   1365 Cass Avenue
   Detroit, Michigan 48226

3. Peter Aldo, Supervisor
   Field Training Unit
   Service Training Section
   Service Operations Department
   Ford Motor Company
   29500 Plymouth
   Livonia, Michigan

4. Dr. Kenneth A. Meade, Sr.
   Manager
   Education & Relations Section
   Public Relations Staff
   G M Technical Center
   Mound Road at 12 Mile
   Warren, Michigan

5. Jack D. Morton, Manager
   Technical and Turbine Training
   Sales & Service Training Center
   Chrysler Motors Corporation
   26001 Lawrence
   Center Line, Michigan

APPENDIX B

THE ROSTER OF TASK FORCE ONE

Mr. Leon Alger	Research Consultant, Division of Vocational Education, Michigan Department of Public Instruction, P. O. Box 928, Lansing.
Mr. James H. Dotseth	Assistant Dean for Technical Education, Schoolcraft College 9901 Newburgh Road, Livonia
Mr. Andrew F. Ford	Vocational Department Head, Finney Junior-Senior High School, 5281 Guilford, Detroit.
Mr. Roland R. Fraser	Director of Manpower Training Program, Detroit Public Scools, 5057 Woodward, Detroit 2.
Mr. John J. Harris	Chief of Trade and Industrial Education, Division of Vocational Education, Michigan Department of Public Instruction, P. O. Box 928, Lansing.
Mr. Max Horton (represented on May 28, 1963 by Mr. James Sagel, Director of Operations Division, MESC)	Director of Michigan Employment Security Commission, 7310 Woodward, Detroit 2.
Dr. Robert C. Lusk	Director of Education, Automobile Manufacturers' Association, 320 New Center Building, Detroit 2.
Mr. Thomas W. McKinnon	Manager of Salaried Personnel and Training Department, Industrial Relations Office, Manufacturing Services, Rouge Office, Ford Motor Company, Dearborn, Michigan.
Mr. Arnold Metz	Director of Vocational Education, St. Clair River Area Schools, 696 Miesner Road, Marine City.
Dr. Ernest L. Minelli	Professor of Industrial Arts, Central Michigan University, Mount Pleasant.

Roster of Task Force One

Mr. Stig E. Ralstrom	Teacher of Drafting, Western High School, Detroit; 1361 Somerset Ave., Grosse Pointe Park.
Mr. Clyde Reed	Representing The Institute for Economic Education, Incorporated, 2619 David Stott Building, Detroit 26.
Dr. William Reitz	Chairman of Evaluation and Educational Research Department, College of Education, Wayne State University, Detroit 2.
Dr. Francis C. Rosecrance	Dean of the College of Education, Wayne State University, Detroit 2.
Mr. Carl H. Turnquist	Divisional Director, Department of Vocational Education, Detroit Public Schools, 467 West Hancock, Detroit 1.

APPENDIX C

THE INTERVIEW INSTRUMENT

The Michigan Study of Industrial Teacher Competence

The following statements or questions have been organized by educational levels or programs (i.e., junior high, senior high, or special vocational school) to focus attention on subject area emphasis and change, and the related industrial teacher competence that is needed in Michigan's schools. These interview items were selected to determine areas of needed improvement in industrial teacher competency. The responses to the interview items will be used as the basis for the development of an action program for the implementation of better industrial teacher education programs.

The items that would seem to be of greatest interest to a person with your responsibilities have been indicated with the number circled. Feel free, however, to respond to any other items about which you may have convictions.

PART A - JUNIOR HIGH SCHOOL (GRADES 7 - 9)

1. Do current industrial arts programs at the junior high level adequately help youth appraise their aptitudes and interests for industrial activities (as this could give direction to youth undertaking pre-vocational preparation for employment)?
   No___ Yes___ Not certain___
   Please explain your response:______________________________
   ____
   ____

2. What other major aims for industrial arts are important at the junior high level?
   ____
   ____
   ____
   ____

3. Should industrial arts teachers at the junior high school level give special emphasis to the identification of an aptitude for manual dexterity as an aim of industrial arts education?
   This is
   ___ of great importance
   ___ of some importance
   ___ of minor importance because of ______________________________
   ____
   ____
   ____
   ____

4. The more complete industrial arts multiple activity programs stress the following subject areas. Would you indicate which of these areas should be retained, in the years ahead, to fulfill the goals mentioned for junior high school students in respect to items 1, 2, and 3.

   ___ a. Woodworking

   ___ b. Metalworking

   ___ c. Plastics

   ___ d. General Drafting

   ___ e. Electricity--Electronics

   ___ f. Power Mechanics (including Hydraulics and Pneumatics)

   ___ g. Graphic Arts

   ___ h. Industrial Crafts (Ceramics, etc.)

5. What other subject areas or major units should be included at the junior high school level in addition to those mentioned in item 4?

6. How would the subject areas or major units mentioned in item 5 contribute to the aims discussed in items 1, 2, and 3?

7. What changes or improvements would you recommend in the preparation of industrial arts teachers for the junior high schools of Michigan?

PART B - SENIOR COMPREHENSIVE HIGH SCHOOLS OR SPECIAL VOCATIONAL SCHOOLS (GRADES 10-12)

8. What should be the major aims for industrial education in Michigan comprehensive senior high schools?

9. What should be the major aims for industrial education in special vocational schools (such as the Wilbur Wright Cooperative High School in Detroit)?

10. Explain the differences that should exist in the aims for industrial education in these two types of schools (questions 8 and 9).

11. What industrial education offerings are needed for the following groups of students, in grades 10-12, in Michigan's schools

    a. for college-bound youth preparing for the professions?

    b. for youth planning to go to community colleges or technical institutes for preparation as technicians (i.e., in the areas of automotive technology, electricity--electronics, etc.)?

c. for youth hoping to qualify for an apprenticeship after graduation from high school in a skilled trade (i.e., building trade or manufacturing industry)?

d. for youth who will enter employment directly after graduation from high school?

e. for youth who drop out of high school and attempt to directly enter employment?

12. What changes or improvements would you recommend in the preparation of industrial education teachers for the comprehensive senior high school?

For the special vocational school (grades 10-12)?

PART C - COMMUNITY COLLEGES OR TECHNICAL INSTITUTES

13. How would you react to these programs for occupational education in the Michigan community colleges or technical institutes?

a. To provide the initial preparation for technicians needed in industrial occupations.

Not important ___ A very important aim ___ Not certain ___

My reaction to this is ______________________________

b. To provide the related instruction for those learners who have entered an organized apprenticeship in the manufacturing or building trades.

Not important ___ A very important aim ___

Not certain ___

My reaction to this is ______________________________

c. To provide basic training for the non-apprenticed trades.

Not important ___ A very important aim ___

Not certain ___

My reaction to this is ______________________________

d. To provide essential technical courses in manufacturing processes (engineering shop), engineering graphics, mechanical technology, electricity--electronics, etc. for those students enrolled in college transfer programs leading to further professional preparation and a degree (such as engineering or industrial teacher education).

Not important ___ A very important aim ___

Not certain ___

My reaction to this is ______________________________

14. What additional programs relating to industrial education should be provided by Michigan's community colleges or technical institutes, other than those mentioned in item 13?

____

15. What preparation should industrial education teachers have to provide the needed industrial education programs, at this level, in respect to:

a. liberal or general education? ______________________________

b. professional education (courses having to do with the theory and organization of education and especially industrial education)? ______________________________

____

____

____

____

c. technical preparation for teaching the designated subject?

____

____

____

16. How should educational leadership identify the subject areas necessary to develop programs that prepare technicians? This could be done:

a. from an occupational survey of placement opportunities within a community.

___ I believe this to be a sound approach.

___ I am uncertain about this approach.

___ This would be of little value because ______________

____

____

b. from an occupational survey of placement opportunities within Michigan.

___ I believe this to be a sound approach.

___ I am uncertain about this approach.

___ This would be of little value because ______________

____

____

c. from an occupational survey of placement opportunities within a regional area of the United States.

___ I believe this to be a sound approach.

___ I am uncertain about this approach.

___ This would be of little value because ______________

____

____

d. from an occupational survey of placement opportunities throughout the entire United States.

___ I believe this to be a sound approach.

___ I am uncertain about this approach.

___ This would be of little value because ______________

____

____

17. Is it possible that the needed industrial education teachers for Michigan's community colleges and technical schools could be identified and selected from those who may now be qualified and presently teaching at other levels? ____________________

____

____

____

____

PART D - OUT-OF-SCHOOL YOUTH AND ADULTS

18. Industrial education programs are needed in public schools to:

a. provide training opportunities in industrial occupations for out-of-school youth and adults who need to acquire salable skills to enter employment.

___ This should not be the responsibility of public education.

___ I agree.

___ I am not certain.

___ My reaction to this is ______________________________

____

____

____

b. provide occupational retraining for those workers whose skills have been displaced by automation or are becoming obsolete.

___ This should not be the responsibility of public education.

___ I agree.

___ I am not certain.

___ My reaction to this is ______________________________

____

____

____

c. provide needed upgrading and updating courses for technicians, skilled mechanics, engineers, or those in industrial supervision with emphasis given to developing greater competency and the improvement of existing skills.

___ This should not be the responsibility of public education.

___ I agree.

___ I am not certain.

___ My reaction to this is ______________________________

____

____

____

d. develop competencies with the common hand and machine tools needed for the maintenance of homes.

___ This should not be the responsibility of public education.

___ I agree.

___ I am not certain.

___ My reaction to this is ______________________________

____

____

____

e. provide organized instruction for persons who would like to meet and work together on common hobbies relative to industrial activities.

___ This should not be the responsibility of public education.

___ I agree.

___ I am not certain.

___ My reaction to this is ______________________________

____

____

____

19. It has proven difficult, and sometimes impossible, to recruit industrial education teachers for programs under the Manpower Development and Training Act, like (a) engine-turret lathe operator, (b) floor assembler, (c) automatic screw machine set-up man, (d) transmission and differential mechanic, (e) auto body repairman, (f) ignition and carburetion mechanic, (g) brake mechanic, (h) motor adjuster, (i) automobile painter, (j) lumber grader, (k) combination welder, and (l) bulldozer operator. How could qualified industrial education teachers be identified and recruited to staff these programs?

____

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____

____

20. Would it be practical to develop a list of potential teachers (persons presently in industry) who have the needed work experience in the occupational area, adequate education (secondary or beyond), and an interest in teaching in manpower training programs?

___ I think so.

___ This is not practical because __________________________

____

____

____

a. If so, how could these industrial persons be identified and recruited for these programs? ______

______

______

______

b. What should be the character and extent of the industrial work experience needed by such persons? ______

______

______

______

c. What should be the extent and nature of the professional college preparation that should be given to these persons after they have been identified? ______

______

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______

______

d. What should be the minimum formal college education required of these teachers for the manpower training programs?

______

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PART E - UPGRADING INDUSTRIAL EDUCATION TEACHERS

21. What changes would you advocate in the present Michigan State Certification Code in respect to industrial education teachers (regular and vocational certification)?

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22. What should be the responsibility of the individual industrial education teacher for maintaining his technical competency?

______

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23. What specific policies, practices, or programs could a school system establish to help keep industrial education teachers competent?

24. What should be the responsibility of the State Department of Public Instruction in establishing or arranging for institutes to improve industrial teacher competency?

25. Please list specific institutes or training programs that are now available to industrial education teachers.

PART F - CONSIDERATIONS FOR EXTENDING INDUSTRIAL EDUCATION PROGRAMS

26. Should students be employed by the public schools or municipal agencies, such as the Board of Water Commissioners or the Department of Building and Safety Engineering of a city, for a meaningful work experience basic to the development of a salable skill?

Impractical, because of

This is a sound approach. I have these specific recommendations for the implementation of this approach in my community.

27. Would it be functional and practical to develop a program that would provide for a selected industrial education student to have a controlled on-the-job work experience with a selected craftsman, technician, or engineer in a specific industry?

Impractical, because of ______________________________

____

____

____

This is a sound approach. I have these specific recommendations for the implementation of this approach in my community.

____

____

____

28. Is the principle of team-teaching applicable to industrial education?

___ No, because ___________________________________

____

____

____

___ Yes, and I have these specific suggestions for the implementation of this method in industrial education.

____

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____

29. How should Michigan's industrial education programs, at the senior high school level, be best organized to prepare individuals to service the products of industry?

____

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APPENDIX D

SPECIFIC ITEMS OF INTERVIEW INSTRUMENT THAT WERE ANSWERED BY RESPONDENTS IN EACH CATEGORY

Items

	PART A							PART B					PART C					PART D			PART E					PART F			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Superintendents			X	X	X	X	X	X	X	X	X	X	(optional) X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	(opt) X
Vocational Directors	X	X	X	X	X	X	X	X	X	X	X	X	(optional) X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Principals	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X	X	X		X	X	X	X	(opt) X
Counselors	X	X	X	X	X	X	X	X	X	X	X	X													X	X	X		
Representatives of Community Colleges								X	X		X	X	X	X	X	X	X	X	X	X	X	X			X	(optional) X	X		X
Representatives of Technical Institutes								X	X		X	X	X	X	X	X	X	X	X	X	X	X			X	(optional) X	X		
Industrial Education Teachers	X	X	X	X	X	X	X	X	X	X	X	X							X		X	X			X	X	X	X	X
Professors of Industrial Education	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Vocational Education Leaders in Michigan			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Representatives from Labor								X	X		X		X	X	X	X	X	X	X	X					X	X	X		X
Representatives from Industry and Business								X	X		X		X	X	X	X	X	X	X	X					X	X	X		X

APPENDIX E

INDUSTRIAL TRAINING FACILITIES AND COURSES AVAILABLE TO MICHIGAN'S INDUSTRIAL EDUCATION TEACHERS

AMMCO TOOLS, INC., Chicago

This company sponsors a one-week course in automotive chassis covering brakes, alignment, steering, wheel balancing, and power units.

The BENDIX CORPORATION, Industrial Control Division, Detroit

A two-week Bendix DynaPath 20 Maintenance Technical Training Program is offered covering the numerical control system. Competence in electronics is a prerequisite.

BINKS MANUFACTURING COMPANY, Chicago

The major units cover spray booths and guns; types, components, preparation for spraying, and film defects of materials; air and material supply equipment; and special spray techniques.

CARTER CARBURETOR, Division of American Car and Foundry
Industries, St. Louis

The Carter Factory Service School provides specialized automotive service tune-up instruction. New models of carburetors are disassembled and studied. Electrical and mechanical fuel pumps are investigated. The problems of fuel delivery are thoroughly explored.

CHRYSLER CORPORATION TRAINING CENTER, Centerline (Detroit),
Michigan

This automotive workshop is a one-week program, usually scheduled during July, and especially planned for teachers of automotive mechanics. The instruction covers trouble-shooting and diagnosis of the electrical system and transmissions.

DELCO-REMY, Anderson, Indiana

Delco-Remy is a Manufacturing Division of GM. Instruction is offered on maintenance techniques pertaining to automotive electrical systems and components. Units cover starting, ignition, and charging systems (namely, storage batteries, cranking motors, conventional and transistor type ignition units, DC and AC generators and the conventional vibrating contact and transistor type voltage regulators).

EVINRUDE MOTORS, Milwaukee, Wisconsin

Special courses have been organized at the Evinrude Outboard Motor Service School for industrial arts teachers. Instruction covers 4-cycle stern-drive engines and conventional boat motors.

FLICK-READY CORPORATION, Bensenville, Illinois

The Miller Fluid Power Institute, sponsored by the Flick-Ready Corporation of Bensenville, Illinois, offers a one-week course in air and air-hydraulics instruction. The major units cover introduction to fluid power, fluid power applications, air cylinders, air valves, air fluid conditioners, piping and air power sources, basic fluid power circuits, air-to-air boosters (pressure intensifiers), air-hydraulic systems, air-hydraulic boosters (intensifiers), and fluid pressure accumulators.

GENERAL ELECTRIC COMPANY, Metallurgical Products Department, Detroit

A one-week program covering modern carbide tool practices on grinders, lathes, milling machines, and torch and induction brazing units.

GENERAL MOTORS CORPORATION, Training Centers Throughout the United States

Teachers or students studying at Wayne State University may participate in special institutes for teachers (usually one week in length) scheduled during vacation periods, or included in training programs with mechanics from service garages. These training centers provide instruction in a wide range of subjects for mechanics or teachers in such areas as hydramatic transmission, automotive electricity, alternators, carburetors, and power steering and brakes (often over a two- or three-day period).

HOBART WELDING SCHOOL, Troy, Ohio

This school, with thirty years experience training welders, offers one or two-week courses for teachers of welding. The course stresses shielded metal-arc, oxyacetylene, gas tungsten-arc (TIG), Micro-wire welding, and the problems of teaching these techniques.

SUN ELECTRIC CORPORATION, Detroit Branch Training Center

Two programs are provided (1) automotive engine testing and (2) starting and charging circuit procedures. Each may be scheduled on an intensive basis for four days for a total of 32 clock hours or for two evenings per week (Monday and Wednesday or Tuesday and Thursday) over a four-week period.

VICKERS HYDRAULICS SCHOOL, Detroit

This school gives thorough and practical training in hydraulic equipment principles and components as they are applied to industrial machinery. The program includes classroom discussions and laboratory sessions to demonstrate the application, and maintenance of hydraulic equipment.

UNIVAC, Division of Sperry Rand Corporation, Detroit

Courses are offered monthly covering programming, wiring logic, and special features of the Univac 1004 (80 and 90 column) Card Processor. Information on dates and times for these courses may be obtained by calling G. C. Erskine at Univac in Detroit: 874-3000, Extension 259.

Other industrial organizations frequently mentioned by the interviewees that make provisions for industrial education teachers are:

LINCOLN WELDING COMPANY
EX-CELLO CORPORATION
INTERNATIONAL BUSINESS MACHINE COMPANY
ROCHESTER CARBURETOR CORPORATION
AUTO-LITE ELECTRICAL EQUIPMENT COMPANY
BARRETT BRAKE COMPANY
DOW CHEMICAL COMPANY
HURON-PORTLAND CEMENT COMPANY

Teachers are encouraged to contact their nearest or preferred teacher education institution for specific information about any of the preceding programs. Most of these opportunities are ordinarily arranged by a university, or local school district.

APPENDIX F

The following specific proposals for action programs or research studies represent the areas of greatest concern to both the interviewees and the staff of this study. While effort has been made to adequately describe the intent and purpose of each proposal, the actual specific details of implementation have been intentionally omitted since it was felt that these details (such as staff, budget, test groups, and evaluation procedure) will not only vary from one proposal to another but, in addition, will vary between the institutions and foundations that may undertake any one or more of these projects.

While it may be also recognized that these eight proposals tend to group themselves under some general headings, they have been kept separated by design so that each is sufficiently delimited to permit consideration of the problem.

Following the conclusion of the listing of the eight proposals is also the Roster of Task Force Group II of The Michigan Study. This roster contains the names of those persons selected to review and make recommendations regarding these proposals.

PROPOSAL ONE

I. Title of Project

An Experimental Program to Recruit and Prepare Needed Industrial Education Teachers for the Detroit Metropolitan Area Schools and the Adjoining Community Colleges: With concern for practices that would be effective for the recruitment, the selection, and the preparation of men and women now needed as teachers for the initial preparation, retraining, and upgrading of persons for the industrial occupations of Michigan.

II. The Problem

would be directed at developing additional and effective policies and practices for the recruitment, the selection, the preparation of men and women desiring to teach industrial education in large urban areas where there is such a serious shortage of such teachers by utilizing experiences in well developed community shops and laboratories.

III. The Specific Objectives of the Project would be to

A. determine if teaching internships could be utilized to adequately prepare teachers of industrial education.

B. explore and develop means for presenting information to selected persons who might be recruited under this program.

C. determine if team teaching may be employed with interns to extend the services of the professional teacher and be used as an effective method for the preparation and development of industrial education teachers.

D. determine

1. those subject areas in industrial education where internships would be desirable and practical.
2. the extent to which the Detroit metropolitan area public schools could provide classroom teaching experiences for the preparation of persons in the experimental program.
3. the extent to which Michigan's universities could conduct appropriate college level courses concerned with the content, theory, methods, and organization of industrial education for persons who would be in preparation through the pilot program.
4. effective industrial teacher education practices for training interns.
5. needed curriculum materials and physical facilities for team teaching and internship experiences.
6. possible changes needed in public school centers in respect to the time schedules, arrangement of physical facilities, and grouping of learners to more effectively use available resources and improve the learning situation.

E. establish an action program for the solution of problems identified by those charged with responsibility for directing and projecting industrial education internships and team teaching in industrial education.

F. disseminate the findings of the experiment toward the goal of providing qualified industrial education teachers for the schools in large urban areas.

IV. Proposed Procedure for the Project

The general plan for conducting this project would be to place persons with variable amounts of post-high school education and industrial experience in selected Detroit area schools under the supervision of selected (and who are considered highly professional) industrial education teachers organized as special teaching teams.

These interns would assist with instructional program, as aids to the professional teachers, with much attention given to the application of sound educational principles to the learning situation. Concurrently, each intern would be required to pursue a part-time college program at a university, such as Wayne State University, (or at a co-operating community college and then finally at a Michigan university) that would lead to a degree, full certification, and professional status as an industrial education teacher.

PROPOSAL TWO

I. Title of the Project

Effective Policies and Practices for Providing Guidance for Occupational Purposes through Industrial Education in Michigan Schools.

II. The Problem

would be directed at providing improved and more adequate preparation for in-service industrial education teachers so that they might be better qualified to assist students in secondary schools of Michigan in appraising their aptitudes and interests for purposes of considering occupational preparation and opportunity.

III. The Specific Objectives of the Project would be

A. to assist in-service industrial education teachers with an understanding and in the use of effective counseling techniques for helping students with vocational guidance.

B. to develop in industrial education teachers a degree of skill in the use of techniques that would assist a student in evaluating his aptitudes and interests.

C. to identify or develop related and enrichment materials for occupational guidance appropriate for on-going industrial education programs of Michigan.

D. to develop an appreciation and an understanding of the functional role of the industrial arts teacher as it relates to the school guidance counselor.

IV. A Plan to Facilitate the Action Program

The objectives of this project would be fulfilled by inviting in-service teachers, counselors, and selected undergraduates to participate in a three-week seminar that would include lectures, discussions, the use of guidance techniques and instruments, and the supervised preparation of appropriate materials for use in the classroom.

A suggested outline for this seminar might be

First Week:

Orientation to counseling and guidance
Occupational classifications and requirements
Counseling techniques

Second Week:

Study of techniques and instruments that could be effectively used by industrial arts teachers, especially at the junior high school level, in helping youth consider, and then make some evaluation, of their interests and aptitudes for continuing their education for entry into such fields as technology, engineering, science, education, and architecture.

Third Week:

This week would be devoted to a clinical experience of having person in the seminar actually observe a class of students at work in an industrial arts laboratory where the techniques and instruments studied during the second week were being applied.

PROPOSAL THREE

I. Title of the Project

A Program to Up-date and Expand Industrial Teacher Competency through the Wayne State University Applied Management and Technology Center.

II. The Project

would be directed at providing improved laboratory facilities and instructional contacts and resources for W S U courses in the areas of mechanical technology, electricity-electronics, and manufacturing and architectural planning for undergraduate students and in-service industrial education teachers. This proposal would further provide for in-service teachers to develop the competency required co cope with technological changes in American industry by participating in selected courses being offered at W S U Applied Management and Technology Center.

III. The Specific Objectives of the Project would be

A. to provide more suitable facilities for the undergraduate and graduate courses offered by the Department of Industrial Education at W S U in mechanical technology, electricity-electronics, and manufacturing and architectural planning.

B. to make it possible for selected in-service industrial education teachers to participate in classes conducted by the W S U Applied Management and Technology Center for technicians from Detroit area industries being upgraded in the evolving technologies, and to receive undergraduate or graduate credit through the Department of Industrial Education by enrolling in Ind. Arts 5170 or 6170 (Field Study for Technical Development) when curriculum materials have been developed for an application of the newly acquired skill and technical knowledge for some specific program in industrial education.

C. for the Department of Industrial Education, College of Education and the Applied Management and Technology Center at W S U to jointly develop and sponsor a national summer center program where in-service industrial education teachers could be upgraded in the more basic modern technologies.

IV. The Proposed Plan for the Implementation of the Project

A. Three of the laboratories located at the Applied Management and Technology Center might be equipped and used jointly by the Center and the College of Education. (1) One of these laboratories might be used to accommodate those courses in mechanical technology presently listed and described as Ind. Arts 1173, 2173, and 6173 in the College of Education Bulletin. (2) Another laboratory might be used for those courses in electricity-electronics presently listed and described as Ind. Arts 2175, 3175, 4175, and 5175 in the College of Education Bulletin. (3) The third facility might be used to accommodate the needed courses in manufacturing and architectural planning presently listed and described as Ind. Arts 1174, 2174, 3174, 4174, 5174, and 6174 in the College of Education Bulletin. When the facilities were not needed for the industrial education program, they could be used for technical courses being sponsored by the Center.

B. Since the Department of Industrial Education presently has much of the equipment needed to conduct the courses described in point A, it could be then that the University might even make a more maximum use of prevailing equipment. And it would seem that both the Center and the College of Education might well profit from such a joint venture.

C. Since the majority of the technical courses in industrial education would need to be conducted during the evening and on Saturdays there would, of course, be some conflict in the joint use of the facilities at the Center. It would appear, however, that the degree that such facilities might be used by both programs might well warrant further consideration.

D. Since the Center during the Summer Quarter would be generally available (especially during the day) for featuring selected technical courses for in-service industrial education teachers, a national program might be conducted similar to the Fluid Power Institute that was conducted at Wayne State University during the summer of 1964. Such institutes and seminars could bring together some of the most outstanding men in the nation in education and in industry to focus on upgrading the technical competence of in-service teachers and in developing and improving the instructional materials needed for occupational education in the schools of the United States.

E. Through the joint efforts of the College of Education and the Applied Management and Technology Center at Wayne State University, arrangements could be made whereby in-service industrial education teachers would be enrolled in Ind. Arts 5170 or 6170, Field Experiences for Technical Development, and then be placed in selected courses presently being conducted by the Center. The College of Education could then be billed for the work station occupied by such a teacher.

PROPOSAL FOUR

I. Title of the Project

The Role of Labor and Management in an Industrial Society

II. The Problem

would be directed at providing industrial education teachers with a more adequate understanding and knowledge of the role of organized labor and industrial management in an industrial society. Special attention would be given to the viewpoint of the citizen who is both a consumer of the product of industry and a participant in the production of goods and services.

III. The Specific Objectives of the Project would be

A. to develop in industrial education teachers a more adequate understanding of the history and development of the organized labor movement.

B. to study and examine the role of the worker in an industrial society with respect to the relationship of organized labor to industrial management.

C. to develop an understanding of, and a familiarity with, such aspects of labor-management relations as collective bargaining, contracts, work rules, federal legislation affecting labor, monopolies, union organization, and strikes.

D. to develop appropriate related and enrichment materials to be used in on-going industrial education programs in schools.

IV. A Plan to Facilitate the Implementation of the Project

The objectives of this project could be met by organizing seminars in conjunction with the Applied Management and Technology Center at W S U. Such seminars could be organized with experts from labor and management lecturing and conducting discussions on such topics as: management-union relations, causes of labor-management strife, administration of the labor contract, salary administration and job evaluation, employee relations in the non-union firm, and negotiating the labor contract. Developing course materials for use in the public schools would be an important goal of these sessions.

These seminars could be scheduled over five and one-half weeks during the summer months under the auspices of the Applied Management and Technology Center and the College of Education at W S U. The Center would be responsible for providing the necessary facilities and experts from labor and industry. The Departments of Social Studies Education and Industrial Education of the College of Education and the Department of Sociology and Anthropology of the College of Liberal Arts could be responsible for providing the professional staff to direct the seminars in co-operation with designated personnel at the Center. The directors for the seminar could be responsible for co-ordinating the development of instructional materials to be used by industrial education teachers in classrooms. Graduate credit might be given for successful participation in the seminars through an appropriate W S U course number in the Department of Social Studies Education of the College of Education.

PROPOSAL FIVE

I. Title of the Project

An Experimental Presentation to Interest Tradesmen in Obtaining a College Education

II. The Problem

would attempt to present the merits of a college education for skilled tradesmen who are now interested and qualified to undertake university level work. Attention would be focused on the great need for industrial education teachers and the unusual professional opportunity that would come to tradesmen now in the Michigan industries who might prepare as industrial education teachers for the public secondary schools, community colleges, and technical institutes of this State.

III. The Specific Objectives of the Project would be

A. to prepare materials that accurately portray the merits and requirements of a college education.

B. to provide an opportunity for a skilled tradesman to discuss the possibilities of a college education with a representative of Wayne State University.

C. to acquaint a skilled tradesman with the specific requirements and information that relate his industrial experience to the teaching of industrial education subjects.

IV. A Plan for the Implementation of the Project

This project would consist of a sixty-minute slide presentation of approximately fifty frames, co-ordinated with a recorded commentary, addressed to skilled tradesmen who have expressed an interest in pursuing a college education.

The following steps could be followed for this project.

1. Prepare the script for the commentary to accompany the slides.
2. Prepare specifications for each of the pictures that would be needed.
3. Take sample shots of needed photographs to determine suitability of equipment and to make an evaluation of scene composition.
4. Photograph required scenes.
5. Process and mount the slides
6. Prepare and edit the accompanying commentary for the presentation.

This project could be undertaken by a graduate student in industrial education at W S U. The graduate student might work under the advisement of a committee that would include such persons as

1. A major professor in industrial education at Wayne State University.
2. A vocational director for a major school system.
3. The director of the Industrial Mutual Association of Michigan.
4. A person in a leadership position, and closely associated with tradesmen, in one of the major corporations of the Detroit Metropolitan area.

PROPOSAL SIX

I. Title of the Study

The Perceptions and Opinions of Selected Persons Qualified to React to Practices that Do and Should Affect Industrial Teacher Competency in Michigan.

II. The Problem

would be directed at identifying and reporting the opinions and perceptions of selected educators and lay persons regarding current industrial education practices to develop improved and more adequate programs of industrial teacher education.

III. The Specific Objectives of the Study would be to

A. conduct an investigation of aims and objectives, programs of study, and practices for the initial preparation and the upgrading of teachers.

B. present summary statements that represent the perceptions of the persons selected to comment at the time of the interviews.

C. formulate conclusions and observations based on the perceptions and opinions of the selected persons qualified to react to prevailing practices affecting industrial teacher competence in Michigan.

D. make recommendations and suggestions for change in industrial education.

IV. Methodology to Facilitate the Research

The Michigan Study of Industrial Teacher Competence addressed itself to the same issues and problems proposed for this further research but the analysis of the data for The Michigan Study was reported only as an over-all item analysis of the responses from the interviewees. It is the intention, then, of this proposal to carry this research one additional step and in much more depth, by re-analyzing data collected from the interviewees.

The organizational pattern of this additional research will call for reporting the responses, forming conclusions and/or observations, and making some pertinent recommendations in terms of the respondent as a typical member of a particular category.

This proposal would differ then from The Michigan Study primarily in that it would provide for an additional analysis of the responses from each interviewee so that a comparison of perceptions regarding the items could be made between the thinking of persons in each of the categories. To illustrate, this study would determine if professors of industrial education in the various state institutions of higher education perceived industrial education in junior high schools in the same, or a similar way, as do superintendents of local school districts. Similar comparisons would be made for each of the other categories.

PROPOSAL SEVEN

I. Title of the Project

Extending Industrial School Experiences and Work-Study Programs for Prospective and In-service Teachers Concerned with Occupational Education

II. The Problem

would be directed at providing prospective and in-service industrial education teachers with additional opportunity to develop the necessary skills and knowledges needed in the emerging areas of occupational education in the public secondary schools, community colleges, and technical institutes.

III. The Specific Objectives of the Project would be to

A. provide undergraduate industrial education students with an opportunity to participate in industry sponsored training programs in areas applicable to industrial education.

B. develop attitudes in teachers conducive to interpreting industry to learners in industrial education programs.

C. complement the university technical course work required of persons preparing to teach industrial education subjects and who would otherwise have little or no opportunity to participate in an industrial school with technicians from industry or to work in an industrial setting prior to a teaching career.

D. upgrade the present skills of in-service industrial education teachers in the emerging and pertinent technical areas.

IV. A Plan to Facilitate the Implementation of the Project

The objectives of this project would be fulfilled by implementing a program consisting of two parts.

Phase one would require making a more complete identification of those industries or companies who now regularly conduct training courses for industrial personnel where prospective or in-service teachers may participate. An identification would also be made of those companies or industries interested in organizing such programs. In addition there are selected companies or industries willing to organize and conduct courses especially for teachers during the periods that they are not busy with their classes. These industries and companies could be identified by working through such professional industrial organizations as the Automobile Manufacturers Association, the Society of Automotive Engineers, and the American Iron and Steel Institute.

Phase two would provide a means whereby the teachers of industrial education or persons preparing to become teachers of industrial education could participate in such training courses described in phase one (or be employed in a co-operative work-study program) and in addition receive university credit for successful participation. This plan is currently being implemented at Wayne State University with enrollment in one of these courses:

Ind. Arts 2170	Co-operative Work Study	(Cr. 2-18 quarter hours, maximum 18)
Ind. Arts 4170	Co-operative Work Study	(Cr. 2-18 quarter hours, maximum 18)
Ind. Arts 5170	Field Experiences for Technical Development	(Cr. 2-12 quarter hours, maximum 12)
Ind. Arts 6170	Experiences for Technical Development	(Cr. 2-12 quarter hours, maximum 12)

Through these courses the Department of Industrial Education at Wayne State University makes the necessary arrangements for fees, materials, and work stations with the respective companies or industries assisting with these essential experiences. The professor directing and supervising the experience assists the student in the development of curriculum materials that provide for an application of the newly acquired skill and knowledge for a specific teaching situation.

PROPOSAL EIGHT

I. Title of the Project

Recruitment of Personnel with Degrees Who Might Be Encouraged to Enroll in a Master of Education Degree Program to Become Qualified to Teach Occupational Education Courses at the Community College or Technical Institute Level

II. The Problem

would be directed at identifying and preparing qualified persons to teach at the community college and technical institute level who are presently engaged in engineering and related technical occupations in industry.

III. The Specific Objectives of the Project would be to

A. identify and recruit engineers (or technicians who have degrees with majors in such subjects as mathematics and physics) presently working in industry who would be interested in following teaching careers.

B. provide the necessary course work in professional education through a specially planned program leading to a Master of Education Degree with a major in Industrial Education, to prepare interested engineers and skilled technicians to teach at the community college or technical institute level.

C. develop procedures and practices suitable for locating, screening, educating, and then placing these engineers or selected technicians in a teaching position.

IV. A Plan to Facilitate the Project

The plan for implementing the specific objectives of this project would be to locate interested engineers (or selected technicians with degrees with a major in mathematics or a science) through existing employment agencies, professional associations, and personal recommendations. These selected engineers and technicians could then be enrolled in a special university program in professional education leading to a Master of Education degree with a major in Industrial Education. It is proposed that because of the industrial experience and maturity of such persons that several of the usual undergraduate requirements prerequisite to the Master of Education Degree be waived. Education courses selected for this masters program would be pertinent and appropriate for preparation to teach at the community college and technical institute level. Also, a portion of such a special master's program might well be completed as an in-service program after placement in one of Michigan's community colleges or technical institutes.

To focus consideration on this proposal, the following program in the Department of Industrial Education at Wayne State University might be suggested (with some of the prerequisites waived for the usual undergraduate courses in education) for a mature person with an accredited Engineering degree and several years of work experience in an occupational area to be projected in one of Michigan's Community Colleges.

Major -- Industrial Education -- (22 quarter hours)

Ind. Ed. 7187	Research Seminar (Cr. 4)
Ind. Ed. 6185	Organizing Course Materials (Cr. 6)
Ind. Ed. 8188	Vocational and Technical Programs in Community Colleges (Cr. 4)
Ind. Ed. 6189	Co-operative Occupational Education (Cr. 4)
Ind. Ed. 7189	Terminal Master's Seminar and Essay or Project (Cr. 4)

General Professional Education Courses -- (12 quarter hours)

History and Phil. of Ed. 7601	Philosophy and Educational Values (Cr. 3)
Ed. Psy. 5741	Mental Hygiene and Its Relation to the Problems of Education (Cr. 3)
Ed. Soc. 7621	Educational Sociology (Cr. 3)
Ed. Guidance 7701	The Role of the Teacher in Guidance (Cr. 3)

Cognate -- (14 quarter hours)

Higher Educ. 6853	History and Philosophy of Higher Education in America (Cr. 4)
Higher Educ. 7855	The Community College (Cr. 3)
Ed. Psy. 6735	The Learning Process and Programmed Instruction (Cr. 3)

Electives in engineering or in such subjects as Mathematics or Physics (Cr. 4)

In addition such a person might be required to schedule these additional courses at the undergraduate level co-requisite with the requirements for the Master's degree.

Ind. Ed. 3187	Methods and Materials of Instruction I (Cr. 4)
Ind. Ed. 4187	Methods and Materials of Instruction II (Cr. 4)

THE ROSTER OF TASK FORCE TWO

Mr. James Alexander	Counselor, Oscoda Area Junior-Senior High School Oscoda, Michigan
Mr. Douglas Bales	Cost Analyst Fisher Body Division General Motors Corporation
Mr. Gerald B. Baysinger	Associate Professor Department of Industrial Education Wayne State University
Mr. Ralph E. Brant	Superintendent Ecorse Public Schools
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